SPECIALIST REPORT:
VEGETATION RESOURCES
BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

SIERRA COUNTY, CALIFORNIA
AND
WASHOE COUNTY, NEVADA

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List of Acronyms

AMSL	above mean sea level
BLM	U.S. Bureau of Land Management
BMPs	Best Management Practices
Cal-IPC	California Invasive Plant Council
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CDFA	California Department of Food and Agriculture
CFR	Code of Federal Regulations
CIAA	cumulative impacts analysis area
COM	Construction, Operation, and Maintenance (Plan)
dbh	diameter at breast height
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
FSH	Forest Service Handbook
FSM	Forest Service Manual
GPS	global positioning system
GIS	geographic information system
kV	kilovolt
MVUM	Motor Vehicle Use Map
NEPA	National Environmental Policy Act of 1969, as amended
NFS	National Forest System
NOI	Notice of Intent
NRS	Nevada Revised Statutes
OHV	off-highway vehicle
PPOD	Preliminary Plan of Development
ROW	right-of-way
SERA	Syracuse Environmental Research Associations, Inc.
SF	Standard Form
SNFPA	Sierra Nevada Forest Plan Amendment
SPCC	Spill Prevention, Control, and Countermeasures (Plan)
SUP	Special Use Permit
SWPPP	Storm Water Pollution Prevention Plan
USFS	U.S. Forest Service

1.0 INTRODUCTION

NV Energy, Inc. (NV Energy) filed a Standard Form (SF) 299 Application for Transportation and Utility System and Facilities on Federal Lands with the U.S. Department of Agriculture, Forest Service (USFS), Carson Ranger District, and the U.S. Department of the Interior, U.S. Bureau of Land Management (BLM), Eagle Lake Field Office. The application was submitted seeking authorization to construct, operate, and maintain a 120-kilovolt (kV) transmission line, which is referred to as the Bordertown to California 120 kV Transmission Line Project (proposed project).

1.1 PURPOSE OF SPECIALIST REPORT

The purpose of this specialist report is to characterize existing vegetation resources within the potentially affected area and to analyze and disclose potential effects on vegetation resources that would occur under implementation of the action alternatives and the No Action Alternative, as described in **Section 1.3** of this specialist report. This report also describes specific design features that would be implemented under the action alternatives in order to reduce or avoid potential impacts on vegetation resources. The data and effects analysis in this specialist report will be used to support an Environmental Impact Statement (EIS) that is being prepared by the USFS pursuant to Section 102 of the National Environmental Policy Act of 1969 (NEPA). The USFS, Carson Ranger District is the lead agency. The BLM, Eagle Lake Field Office is a cooperating agency in the preparation of the EIS, and several state and local agencies are also participating as cooperating agencies.

This specialist report focuses on the vegetation resources on National Forest System (NFS) land within the potentially affected area. There is also BLM-administered public land and private land that may be impacted by the proposed project and thus the resources on these lands are also discussed in this specialist report.

1.2 PROPOSED PROJECT

Sections of the proposed transmission line that would cross NFS land or public land administered by the BLM would be constructed, and then operated and maintained within a right-of-way (ROW). The ROW would be a strip of land that measures 45 feet in width on either side of the proposed transmission line alignment, making the total width 90 feet. Because the ROW boundary would be equidistance from either side of the transmission line alignment, the alignment is effectively the longitudinal centerline of the ROW. Sections of the proposed transmission line that would cross private land would be constructed, operated, and maintained within easements. NV Energy would provide financial compensation for easements to private owners as determined by a qualified third-party appraiser, through negotiations, or through the

courts. Easements would also be 90 feet wide, measured 45 feet in width on either side of the alignment.

The proposed project consists of:

- the construction, operation and maintenance of a 120 kV overhead transmission line between the existing Bordertown and California substations in Sierra County, California;
- modifications and improvements to both substations for accommodating the addition of the proposed transmission line, including expansion of the existing boundary of the Bordertown Substation facility; and,
- widening of existing roads and construction of new temporary access roads necessary for construction and maintenance of the proposed transmission line.

The proposed transmission line would consist of bundled aluminum conductor steel-reinforced cable supported on single-circuit pole structures. A combination of single-pole structures, two-pole H-frame structures, and three-pole dead end/angle structures would be used for the proposed transmission line. Single-pole structures would be used less frequently because they would generally be used only where confined space prevents the use of the wider two-pole H-frame or three-pole dead end/angle structures. Single pole structures would be approximately 60 to 90 feet tall, depending on terrain and obstructions. The two-pole H-frame structures and the three-pole dead-end/angle structures would be approximately 50 to 90 feet tall, depending on terrain or obstructions. The span distance between the poles would typically average 800 feet but could range from 200 feet to 2,000 feet depending on terrain or obstructions. Weathered steel, characterized by a stable, rust-like finish that closely resembles the color of wood poles, would be used for all poles.

1.2.1 Project Construction

Construction of the proposed transmission line would consist of the establishment of staging areas, pole sites, and transmission wire setup sites; the construction of access roads, including widening existing roads; and, the installation of the pole structures and conductor and shield wires. The exact location of these project elements would be determined prior to construction. See the Preliminary Plan of Development (PPOD) (JBR Environmental Consultants, Inc. 2009) for a detailed description of power pole assembly, wire stringing, and construction equipment.

Up to four staging areas may be needed to store construction materials, equipment, tools, fuel, service trucks, spare parts, and vehicles. The staging areas would house portable, self-contained toilets and possibly portable offices or serve as equipment maintenance areas. Staging areas would measure approximately 500 feet in length by 500 feet in width. No staging areas would be located on NFS land. Any hazardous materials such as fuel, lubricants, and solvents, would be

handled and stored in accordance with applicable regulations, including Title 40 Code of Federal Regulations (CFR) Part 262 (40 CFR 262). Handling, storage, and clean-up of hazardous materials at staging areas would be described in a Spill Prevention, Control and Countermeasures (SPCC) Plan, which would be included as part of the Construction, Operation, and Maintenance (COM) Plan. Staging areas would include secondary containment to capture and contain any potential spills or leaks.

Poles would be set in the ground, typically without a foundation or footing, and then backfilled with native soils removed during excavation of the hole for the pole structure and/or imported backfill material (i.e., soils). Guy wires and soil anchors would be installed on three-pole dead-end/angle structures to offset changes in wire tension due to the change in the direction of the transmission line at angle poles. Concrete foundations would be used with self-supporting angle pole structures where guy wires and soil anchors could not be installed to support three-pole dead-end/angle poles, such as when there is roadway interference. Pole sites, which are the area at each proposed power pole structure that would be required for the construction equipment, excavation of the hole for the pole, and installation of the pole structure, would not exceed approximately 0.5 acre in size for single-pole and two-pole H-frame structures. Pole sites would typically not exceed 1 acre in size for three-pole dead-end/angle structures and self-supporting angle pole structures on concrete foundations. Pole sites in steeper terrain may be graded level for safe operation of equipment. Level equipment pads would not be re-graded, but reseeded so that the pad would be available for future maintenance of the pole. Materials, including the transmission poles, insulators, guy wire anchors, and all other associated hardware, would be delivered from staging areas to each of the pole sites.

After pole structures have been assembled and installed, construction crews would perform wire stringing and installation of conductors and shield wires. Wire stringing and installation activities would be performed from transmission wire setup sites. Transmission wire setup sites would measure approximately 600 feet in radius. It is anticipated that wire installation and stringing would require between 6 and 16 transmission wire setup sites. The number of sites is a function of wire-reel span lengths and engineering requirements for conductor sagging.

Existing roads would be used for construction and maintenance access as much as possible. In order to accommodate construction equipment, roads would be widened up to 30 feet, including cut and fill slopes. Roads that would be widened include designated NFS roads and two-track roads (i.e., roads shown on the Carson District Motor Vehicle Use Map [MVUM] [USFS 2011]). Certain roads that are wide enough to not require widening may need blading or installation of erosion control measures. Road improvements would comply with: 1) *The Forest Service National Supplements to the FP-03* (USFS 2010b); 2) the Forest Service Handbooks (FSH) for road construction (FSH 7709.56 and FSH 7709.57); and, 3) the Forest Plan. Several designated NFS roads have seasonal use restrictions from April 1 to November 18 that would be followed

during construction. All designated NFS roads widened for construction or maintenance access would be restored to the original roadbed width and the areas that were disturbed from widening would be re-contoured and seeded.

New access roads (i.e., centerline travel road and spur roads) would be constructed to pole sites, transmission wire setup sites, and staging areas when there are no existing roads available. Access roads would be 30 feet wide and located within a 300- to 600-foot-wide corridor (variable-width corridor). The variable-width corridor would be centered on the transmission line and would measure 300 feet wide where slopes are 10 percent or less, and 600 feet wide where slopes are greater than 10 percent. Roads would be constructed primarily by mowing or masticating vegetation in a manner that leaves root systems intact to encourage re-growth and minimize soil erosion. Whole-tree removal would be necessary where new access roads cross forested areas. Rocks or other obstructions would be bladed. If rocks cannot be removed with heavy equipment, blasting may be used. While new access roads wider than 30 feet would not be expected, occasional widening beyond 30 feet may be necessary in areas where extensive blading and side cuts are required. Erosion and sediment controls would be installed as identified in the project Storm Water Pollution Prevention Plan (SWPPP), which would be included as part of the COM Plan.

Road construction across perennial streams would be avoided. Where improvements are needed to cross ephemeral and intermittent streams, the side slopes of drainages would be reduced to a slope that would allow safe vehicle travel, and the slopes and drainage bottom would be rock armored. Once construction is complete, all drainage modifications would be re-graded to restore pre-construction contours and seeded based on existing site conditions.

After construction, new access roads would be re-graded (i.e., re-contoured) and stabilized by seeding and installing erosion control features such as water bars. Where deemed appropriate by the USFS, roads near sensitive resources may not be re-graded in order to avoid inadvertent disturbance to resources. Barriers would be installed on all restored access roads located on NFS land to prevent unauthorized vehicle use. If future road access is needed for maintenance of the transmission line and depending upon the level of proposed new disturbance or the change in environmental conditions, a review of the sufficiency of the existing NEPA analysis would be made.

The approximate ground disturbance for each construction activity or area is provided in **Table 1-1**. Most ground disturbance would be temporary and would be restored following construction. Other disturbance would be permanent, such as the pole-structure footings at each pole site.

Table 1-1 Temporary Ground Disturbance Required for Project Construction

Construction Activity or Area	Approximate Construction Dimensions/Disturbance	Estimated Number
Poles structures: Single pole Two-pole H-frame Three-pole dead-end/angle	 85-foot radius (+/- 0.5 acre) 85-foot radius (+/- 0.5 acre) 120-foot radius (+/- 1.0 acre)	Span distance between pole structures would typically average 800 feet, but could range from 200 to 2,000 feet depending on terrain or obstructions
Transmission wire setup sites	Approximately 600 feet radius (+/- 26 acres)	Between 6 and 16 sites, but would vary by alternative
Staging areas	500 feet long and wide (+/- 5.7 acres)	As many as 4 construction staging areas would be necessary
Widening of existing roads	30-foot-wide disturbance (consisting of a traveled way measuring up to 14 feet wide plus any curve widening, turnouts, and side cut and fill slope areas)	Varies by alternative (see **Sections 1.3.2.1** through **1.3.2.4**)
New access roads (i.e., spur roads, centerline travel road, and cross country travel)	30-foot-wide disturbance (consisting of a traveled way measuring up to 14 feet wide plus any curve widening, turnouts, and side cut and fill slope areas)	Varies by alternative (see **Sections 1.3.2.1** through **1.3.2.4**)
Tree removal from transmission line clearance area	Clearance area includes area directly beneath transmission line and areas within 21 feet to either side of each transmission line cable. Additional trees within ROW or outside of ROW that may potentially fall onto the cables or pole structures would be removed. Construction of log landings (+/- 0.5 acre) would create additional disturbance	Varies by alternative (see **Sections 3.2.3** through **3.2.6**)

Source: (JBR Environmental Consultants, Inc. 2009)

During construction, vegetation would be removed as needed at pole sites, staging areas, transmission wire setup sites, access roads, and landings. Trees would also be removed from the clearance area required for overhead transmission lines per National safety and reliability standards and rules and California and Nevada regulations. The most restrictive of these standards, rules, and regulations require that obstructions be no closer than 21 feet to overhead 120 kV transmission lines. A transmission line can be expected to sag during heavy electrical loading and warm weather to within 22 feet of minimum line clearance of the ground at mid-span. To achieve the required clearance, all trees beneath the proposed transmission line and 21 feet of either side of the conductor cables would initially be removed during construction. Beyond 21 feet, any tree with the potential to fall onto the conductors or pole structures would also be removed, regardless of whether the tree is located within the proposed ROW/easement.

Removal of trees from within 21 feet of the conductors, as well as trees with potential to onto the conductors or pole structures would routinely continue as needed through maintenance of the project.

Removal of vegetation would generally consist of mowing or masticating shrub and grass vegetation in a manner that leaves root systems intact to encourage growth and minimize soil erosion. During construction in forested areas, whole trees would be removed using heavy equipment where terrain and slope stability permits and skidded to log landings for disposal. In areas with excessive slopes and highly erodible soils, trees would be felled by crews with chainsaws and removed with helicopters. Slash would be removed or chipped and broadcast onto an adjacent area to prevent fuel loading. Skid trails and landings used to remove timber will be designated and approved by the USFS prior to use. Tree removal during maintenance of the proposed transmission line would be performed using chainsaws, masticator, or skidding equipment. Maintenance access would be by foot-travel, pickup truck, bucket truck, or off-highway vehicle (OHV) from the nearest designated NFS or maintenance road. Prior to cutting trees on private land in California, a *Public Agency, Public and Private Utility Right of Way Exemption* would be obtained from the California Department of Forestry and Fire Protection. The exemption would waive the requirement to prepare and file a Timber Harvesting Plan.

Construction of the proposed project is estimated to require 8 to 12 months to complete, depending on weather or other unforeseeable events. Near sensitive receptors (i.e., occupied residences), noise-generating activities (e.g., blasting) would be limited to Monday through Friday from 7:00 a.m. to 7:00 p.m. Otherwise, work may occur 12 hours per day any day of the week, in accordance with applicable restrictions, such as fire restrictions and red flag warnings. The size of the construction workforce would vary depending upon the active construction phase, but it is anticipated that it would generally include 50 to 100 people. Typical equipment and vehicles necessary for construction of the proposed project would range from standard-sized pickup trucks, to large cranes and bulldozers. Depending on site specific conditions encountered during construction, a helicopter may also be required. All construction equipment, surplus construction materials, and construction debris and wastes would be removed upon completion of the proposed construction activities and any maintenance activities.

1.2.2 Project Restoration

The terms “reclamation” and “restoration” are used interchangeably throughout this report, as are the terms “reclaim” and “restore”. Restoration of the transmission line ROW/easement area and all other areas outside of the ROW/easement disturbed from construction activities would be performed once construction is complete. All staging areas, transmission wire setup sites, skid trails and landings would be re-contoured to restore pre-construction topography. Pre-construction topography would also be restored at all pole sites, with the exception of those

located on steep terrain with slopes of 15 percent or greater. A level pad measuring approximately 0.25 acre in size would not be re-contoured at pole sites located on slopes of 15 percent or greater. The level pad would be revegetated, but its contours would be retained for the later maintenance and/or potential future repair of the pole structures at these pole sites. The remaining area at pole sites located on steep terrain would be re-contoured to restore pre-construction topography.

Existing roads on NFS land that were widened for construction access would be restored to their pre-construction width and areas disturbed from widening would be re-contoured and seeded. New access roads constructed on NFS land would be re-contoured to restore pre-construction topography. However, where deemed appropriate by the USFS, new access roads near sensitive resources may not be re-contoured in order to avoid inadvertent disturbance to resources. All new access roads constructed on NFS land and all existing unauthorized roads used for access on NFS land would be blockaded following construction to prevent any additional motorized use and promote restoration success. The type of barricade used for blockading roads would be approved by the USFS prior to installation. To aid in reclamation, other techniques approved by the USFS may be implemented, including the use of logs, branches, pine needles, brush and rocks placed on the reclaimed roads to disguise their existence.

Establishment and restoration of vegetation cover would be accomplished by ripping and seeding. With the exception of the California and Bordertown substations, all areas disturbed by construction would be seeded, including landings and skid trails, the level pad areas retained at pole sites on steep terrain, and all new access roads. Surface disturbance at the existing substation facilities would not be seeded because vegetation cover should not and currently does not occur within the boundary of either substation. Seed mixes and seeding rates would be tailored to the vegetation community, soil substrate, elevation, and land administration/ownership. However, all seed mixes would be certified as weed-free and approved by the appropriate land management/regulatory agencies. Prior to seeding, any topsoil stockpiled during construction would be replaced and sufficiently stabilized. Loosening of compacted soils that may have resulted from construction activities would also be performed prior to seeding. Chips may also be incorporated into the soil as needed. Restoration success would be monitored afterwards.

A detailed plan for restoration of construction-related ground disturbance would be included as part of the COM Plan. The restoration plan would include re-vegetation success criteria based on USFS vegetation matrices and reference sites. Reference sites would be determined prior to commencement of construction. Restoration success on NFS land would be monitored until it is deemed successful by the USFS.

1.2.2.1 Noxious Weed Monitoring and Treatment Plan

A noxious weed monitoring and treatment plan will be developed by NV Energy and will be included as part of the COM Plan, as well as part of an annual operating plan. The noxious weed monitoring and treatment plan would describe noxious weed treatment methods, environmental protection measures, success criteria, monitoring, and remediation. The noxious weed monitoring and treatment plan would be implemented in conjunction with the design features listed in **Section 1.2.4**.

Noxious weeds infestations would be treated within areas where project surface disturbance would occur, prior to commencement of surface disturbance activities. Additionally, on NFS land and BLM-administered public land, noxious weeds would be inventoried and treated within the entire ROW area and areas within 100 feet of project surface disturbance. Treatment methods would include manual and mechanical methods, and the use of herbicides. A 5-gallon back-pack sprayer would likely be the primary method of herbicide application, but large infestations may require a truck-mounted sprayer. The following herbicides would be used for treatments (brand/shelf name is parentheses): Aminopyralid (Milestone); Clopyralid (Transline); Chlorsulfuron (Telar); Glyphosate (Roundup and Rodeo); Imazapic (Plateau, which is not labeled for use in California, but may in the future); and Triclopyr (Garlon).

1.2.3 Operation and Maintenance

The transmission line would be operated from the NV Energy Electrical Control Center in Reno, Nevada. Personnel at the Electrical Control Center would monitor voltage and power flow along the transmission line in accordance with standard operating procedures.

NV Energy would inspect the line annually to determine if maintenance is needed. Annual inspections would be from helicopter or from the ground by walking to pole structures from existing roads. An inspection that involves climbing pole structures is anticipated once every 10 years. Access to the transmission line would be from existing roads using pickup trucks, an all-terrain OHV or by walking to the pole structure. The ROW would be patrolled after unexplained outages or significant natural incidents (such as fires, earthquakes, floods, torrential rains, avalanches, or extreme electrical storms) to observe facility conditions and the surrounding environment and to begin repairing any damages. Trees that could interfere with the safe operation of the transmission line would be removed as needed (see **Section 1.2.1**).

1.2.4 Design Features Common to All Alternatives

Project design features are developed to reduce or avoid environmental effects resulting from construction, operation, and maintenance of the proposed project. Preliminary project design features came from the PPOD (JBR Environmental Consultants, Inc. 2009) submitted with the SF299 application, from the interdisciplinary team, and other plans and regulations. Design features that are specifically associated with vegetation resources or are critical in the impacts

analysis presented later in this specialist report are listed below. The entire list of design features may be found in Chapter 2 of the pending Draft EIS (DEIS) for this project.

Noxious Weeds (NW):

NW 1. Noxious weeds occurring on either the Nevada or California State list will be mapped and the full extent of the population will be treated prior to construction. Inventory and treatment areas on NFS land will extend 100 feet from the ROW and all ground disturbed by project activities. Project disturbances include roads proposed for widening, construction access roads, and vegetation removal, including skid trails and landings.

NW 2. Monitoring and continued treatment in areas that were treated prior to construction will commence the first full growing season after project implementation. Weed treatment will continue until disturbed areas are successfully restored (see restoration criteria). Weed treatment will also be addressed during maintenance activities.

NW 3. All equipment utilized off of existing roads and motorized trails will be cleaned with a high pressure power washer of all mud, dirt, and plant parts. Following cleaning, equipment will be inspected for plant parts (e.g., leaves, stems, seeds). Equipment will be cleaned and inspected again prior to re-entry if it leaves the project site. Equipment will be inspected and cleaned again before moving from an area within the project area with known noxious weed species. Inspections will be completed and documented by qualified personnel.

NW 4. When cut and fill is required to create log landings, topsoil will be stockpiled and covered to prevent weeds from establishing in the soil. This topsoil will be re-spread during restoration of the landings.

NW 5. Staging areas shall not be located in weed infested areas. Staging areas will be inspected by qualified personnel for pre-approved use to reduce the risk of introducing noxious weeds into the project area.

NW 6. Construction of access roads will not occur in areas heavily infested with noxious or invasive weeds.

NW 7. Restoration seed mixes will be certified as weed-free.

NW 8. All gravel and/or fill material will be certified as weed-free.

NW 9. NV Energy will coordinate with other county, state and federal agencies to address and treat landscape level infestations of invasive plant species.

NW 10. When invasive plants are grubbed or manually removed, methods that prevent seed spread or re-sprouting will be used. If flowers or seeds are present, the weed will be pulled carefully to prevent seeds from falling and will be placed in an appropriate container for disposal. If flowers and seedheads are not present or are removed and disposed of as described above, the invasive plant may be pulled and placed on the ground to dry out.

Herbicide Use (HE):

HE 1. Herbicides will be used in accordance with label instructions, except where project design features describe more restrictive measures. An herbicide use plan will be developed and included in the COM Plan.

HE 2. Prior to the start of application, all spray equipment will be calibrated to insure accuracy of the delivered amounts of herbicide. Equipment used during herbicide application will be regularly inspected to insure it is in proper working order.

HE 3. Herbicides will be applied by trained and/or certified applicators in accordance with label instructions and applicable federal and state pesticide laws. Label instructions include precautions on application under certain wind, temperature, precipitation and other weather conditions to reduce drift, volatilization, leaching, or runoff.

HE 4. Herbicide spray applications will not occur when wind velocity is 5 miles per hour or greater to further minimize the potential for drift.

HE 5. Herbicide applications will not be conducted during rain or immediately following rain when soil is saturated or runoff or standing water is present. Application will occur only under favorable weather conditions, defined as:

a) 30% or less chance of precipitation on the day of application based upon National Weather Service weather forecasting for the Reno area;

b) If rain, showers or light rains are predicted within 48 hours, the amount of rain predicted shall be no more than ¼ inch of rain; and

c) Rain does not appear likely at the time of application.

HE 6. Preparation of herbicides for application, including mixing, filling of wands and rinsing of spray equipment, will take place outside of wetlands, meadows, riparian zones, wells and springs, and other sensitive sites, and more than 300 feet from surface water. Herbicide preparation will occur only on level, disturbed sites such as the interior of landings. A water truck would be used to provide water for mixing in the field.

HE 7. A spill cleanup kit will be readily available whenever herbicides are transported or stored. A spill kit would be carried by the applicator at all times when using the wicking application method.

HE 8. Low nozzle pressure (<25 pounds per square inch), and a coarse spray (producing a median droplet diameter of >500 microns) will be used in order to minimize drift during herbicide applications.

HE 9. Prior to treatments in areas of concentrated public use, the public will be notified about upcoming herbicide treatments via posting signs.

HE 10. The herbicide spray nozzle will be kept as close to target plants as possible (within 20 inches) while achieving uniform coverage in order to limit overspray and drift to non-target vegetation.

HE 11. Where riparian vegetation communities occur, herbicide application will be limited to directed foliar spray or wiping methods and spray will be directed away from native vegetation.

HE 12. Herbicide treatments will not occur within 500 feet of sensitive plant occurrences.

HE 13. Treatment areas will be evaluated for restoration and revegetation by the USFS botanist and soil scientist.

HE 14. Herbicide application within wet meadows will be limited to treating invasive plant infestations that occupy less than 100 square feet. Herbicide applications will be limited to wiping techniques with aminopyralid, chlorsulfuron, and glyphosate and treatment of the following high priority species: Canada thistle (*Cirsium arvense*), Russian knapweed (*Acroptilon repens*) or tall whitetop (*Lepidium latifolium*) which are difficult to eradicate with non-chemical means. Meadows will be surveyed for special status plant species prior to any chemical treatments and will be monitored post-treatment to determine effects to non-targeted vegetation.

HE 15. Herbicide application will not occur within the established buffers for aquatic features shown in **Table 1-3**.

Table 1-3 Minimum Buffers for Herbicide Application Near Aquatic Features

Herbicide	Application Method	Dry Aquatic Features (feet)	Streams[1] or Ditches with Water[2] (feet)	Wetland or Meadow (feet)
Aminopyralid	Spot and directed foliar spray	25	25	100
	Wiping	15	150	15
Chlorsulfuron	Directed foliar spray	25	100	100
	Wiping	15	15	15

Herbicide	Application Method	Dry Aquatic Features (feet)	Streams[1] or Ditches with Water[2] (feet)	Wetland or Meadow (feet)
Glyphosate	Directed foliar spray or drizzle	0	25	25
	Cut stump or wiping	0	15	15
Imazapic	Directed foliar spray	25	75	75
Triclopyr	Directed foliar spray	25	75	75
	Cut stump or wiping	15	15	15
Clopyralid	Spot and directed foliar spray	25	50	50
	Wiping	15	15	15

[1]As measured from the edge of stream channel. If a defined channel is not present (draws do not have defined channels), measurement is from bottom of the feature.
[2]As measured from the edge of the wet area or the meadow vegetation, whichever is greater. Limited conditions allowing for herbicide application within meadows are described in design feature HE-17.

HE 16. Herbicide application is limited to targeted treatments directed at the plant (spot treatments of the immediate area surrounding the plant are allowed with aminopyralid and clopyralid, only) using a backpack sprayer; broadcast spray methods that dispense chemical over a non-localized area will not be used.

HE 17. Avoid application of Aminopyralid and Clopyralid sprayed mulch materials on revegetation sites.

Vegetation (VG):

VG 1. Placement of the ROW will avoid wherever possible, isolated groups of trees and/or groups of trees with an average diameter at breast height (dbh) of 30 inches or greater as directed/approved by the USFS.

VG 2. All trees measuring 8 inches or greater in dbh that need to be removed shall be identified by the USFS prior to felling on NFS land.

VG 3. For trees measuring 8 inches or greater in dbh, stump height shall not exceed 12 inches above ground level on the uphill side or 12 inches above natural obstacles. Trees less than 8 inches in dbh, stump heights shall not exceed 6 inches above ground level on the uphill side or 6 inches above natural obstacles.

VG 4. Trees identified for removal will be whole tree yarded to log landings for disposal. All logs and slash will be removed from NFS land. Woodchips not needed for restoration will also be removed from NFS land.

VG 5. Where removal of vegetation other than trees is unavoidable, the vegetation will be cut at ground level to preserve the root structure and allow for potential sprouting.

VG 6. All areas of temporary ground disturbance that result from the construction or maintenance of the project will be restored as required by the land management agency and per any applicable permits. Restoration will include restoring contours to their approximate pre-construction condition, stabilizing the area, installing erosion control features (such as cross drains and water bars), and seeding and re-vegetating. Revegetation may include incorporation of chips into the soil as needed, installing erosion control features such as installing cross drains and placing water bars in the road.

VG 7. Successfully restored areas will be defined as:

Reference sites will be pre-established and approved by the USFS. Reference sites will include plant communities that are representative of the ecological site as described by NFS Matrices. Reference sites must include plant communities that are in a late-seral and ecologically functioning condition.

VG 8. Project implementation will comply with conditions in Lahontan Water Quality Control Board timber harvest waiver.

Forest Health (FH) - Insects and Disease

FH 1. To reduce the build-up or residual tree mortality by pine engraver beetles (*Ips pini*), and reduce fuel loading the following measures shall occur:

a) Whole trees greater than 3 inches dbh (whether in accessible or inaccessible areas) will be removed (after proper permitting) to established log landings within 6 weeks of cutting. Slash will be chipped and hauled off of NFS land for disposal. Any incidental breakage during whole-tree yarding that is 3 inches in diameter or greater will be lopped and scattered to within 18 inches of the ground in open areas.

b) Timing: In areas where material 3 inches of greater in diameter is left on site, cutting shall only occur from August 1 through December 31. Material must be lopped and scattered to within 18 inches of the ground in open areas. There are no timing restrictions for dead trees or species other than pine.

Recreation/Roads/Transportation (RT):

RT 1. The use of any roads or trails will require compliance with the Carson Ranger District MVUM, including any restrictions for seasonal use.

RT 2. All new temporary access roads and all improvements to existing roads will comply with: 1) The Forest Service National Supplements to the FP-03 (USFS,

2010); 2) the USFS Road Construction Handbooks (FSH 7709.56 and FSH 7709.57); and, 3) the Forest Plan.

RT 3. All new access roads (i.e., spur roads and centerline travel roads) specifically constructed for this project, including those determined to be necessary for maintenance of the transmission line, will have a physical closure installed to prevent motorized access immediately following the completion of construction and restoration. The types of closure and design specification used will be approved by the USFS prior to installation.

RT 4. Physical barriers such as boulders or natural features designed to harmonize with the natural environment of the surrounding area will be installed to prevent unauthorized vehicle use from occurring on restored roads. The use of gates or other such structures for this purpose will be avoided unless determined necessary by the USFS.

RT 5. Maintenance activities which cause a road to be opened to unauthorized vehicles or damage to restoration improvements will need to be assessed and barriers reinstalled as needed at the expense of NV Energy.

RT 6. Restored roads will require a signage and monitoring plan implemented by NV Energy for compliance with the closure which will include inspecting the barricade areas to determine the effectiveness of the blockades at preventing unauthorized motorized vehicle use of the restored access roads. Signs will notify the public that construction access roads are closed and are being restored. Signs will be replaced by NV Energy if vandalism occurs to the signs.

RT 7. If unauthorized vehicle use occurs on restored roads, barricades and reclamation would be monitored for effectiveness and remedial measures taken. Monitoring will continue until disturbed areas are successfully restored.

RT 8. Public access will be maintained with minimal delays during the construction and maintenance of the project. If there are traffic delays, NV Energy will post delay information at National Forest portals.

RT 9. All construction vehicle movement will be restricted to the transmission line ROW/easement, pre-designated access roads, public roads, and private roads. All existing roads will be left in a condition equal to or better than their preconstruction condition.

1.3 PROPOSED ACTION AND ALTERNATIVES

The Stateline Alternative was presented as the Proposed Action in the Notice of Intent (NOI) to Prepare an EIS in the Federal Register and to the public during scoping meetings. This

alternative is no longer feasible and is now an alternative that was eliminated from detailed study for the reasons discussed in Chapter 2 of the pending DEIS.

With the elimination of the Stateline Alternative, the alternatives selected for analysis in the DEIS and in this specialist report include:

- No Action Alternative
- Mitchell Alternative
- Peavine Alternative
- Poeville Alternative
- Peavine/Poeville Alternative

Each of these alternatives is described below.

1.3.1 No Action Alternative

Under the No Action Alternative, the USFS would not issue a Special Use Permit (SUP) for a transmission line ROW across NFS land, and the BLM would not issue an amended ROW Grant for a transmission line or substation expansion on BLM-administered public land. Thus, the construction, operation, and maintenance of the proposed transmission line across NFS land and BLM-administered public land, as well as private land would not occur. The existing 120 kV system would continue to rely on the #141 and #142 transmission lines for transmitting electric load to the West Reno/Verdi area in the foreseeable future. The No Action Alternative does not provide the redundancy needed in the system and therefore would not meet the purpose and need for the project.

1.3.2 Action Alternatives

The four action alternatives analyzed within this specialist report consist of the Mitchell, Peavine, Poeville, and Peavine/Poeville Alternatives. Under implementation of any of the action alternatives, the USFS would issue a SUP for a transmission line ROW, and the BLM would issue an amended ROW Grant. For temporary roads and construction access located outside of the transmission line ROW, the USFS would issue a temporary SUP. NV Energy would purchase easements from private landowners for construction and operation of the line across private property. The ROW and easements for the proposed transmission line would be 90 feet wide for all action alternatives. The total acres of ROW and easements would vary among each of the action alternatives. **Table 1-4** provides a summary of the total miles of proposed transmission line and total acres of ROW/easement area that would occur on NFS land, BLM-administered public land, and private land for each action alternative.

Table 1-4 Summary of Action Alternatives

Action Alternative	Length of Alignment Alternative (Miles)				Area of ROW/Easement Required (Acres)			
	NFS Land	BLM-Administered Public Land	Private Land	Total (All Land)	NFS Land	BLM-Administered Public Land*	Private Land	Total (All Land)
Mitchell	8.4	0.4	2.9	**11.7**	91.6	8.1	31.6	**131.3**
Peavine	7.0	0.4	2.9	**10.3**	76.4	8.1	31.6	**116.1**
Poeville	3.8	0.4	13.8	**18.0**	44.7	8.1	147.3	**200.1**
Peavine/ Poeville	4.3	0.4	7.1	**11.8**	46.9	8.1	78.5	**133.5**

* Includes proposed expansion area associated with the Bordertown Substation.

Implementation of any of the action alternatives would result in the construction, operation, and maintenance of the proposed project as described in **Section 1.2**. The same construction methods and procedures and design features would be used. The location of construction staging areas and wire set-up sites are placed specific to the unique conditions and configuration of a particular alignment. Construction staging areas would not be located on NFS land under any action alternative, but transmission wire setup sites may be located on NFS land. The presence and condition of existing roads available for construction access is also unique and specific to the action alternatives. Consequently, the total length of existing roads that would require improvements to use for construction access would vary among the action alternatives. The total length of new temporary access roads required for construction of the project would also vary among the action alternatives.

1.3.2.1 Mitchell Alternative

The Mitchell Alternative would be approximately 11.7 miles long. The first approximately 5.0 miles would be identical to the first approximately 5.0 miles of the Peavine Alternative and generally parallel with the California and Nevada State line, staying approximately 0.6 to 0.9 mile east of the state line. The last approximately 0.8 mile of the alignment would also be identical to the Peavine Alternative. The last approximately 0.4 mile of transmission line into the California Substation would utilize single pole structures with a distribution line under-build to accommodate the new transmission line and existing distribution line on the same poles. Approximately 4.6 miles of the Mitchell Alternative would be located adjacent to an existing power line corridor (**Figure 1**).

Approximately 11.1 miles of roads would be widened for construction access. **Table 1-5** presents the miles of road required to be widening and the surface disturbance associated with the widening.

Table 1-5 Road Widening Required for the Mitchell Alternative

Road/Route Type	Widening Required (Miles)	Surface Disturbance (Acres)[1]
Designated NFS Roads on NFS Land	5.6	14.4
Non-Designated Routes on NFS Land	1.1	2.7
Existing Roads Across Private Land	4.4	11.2
Total (Roads/Routes on All Land):	11.1	28.3

[1] Does not include existing road disturbance, which is assumed to be 9 feet wide.

The location of temporary new access roads would be determined prior to construction, but would be located within a 300- to 600-foot-wide variable-width corridor. Approximately 7.1 miles of new temporary centerline travel roads would be needed for construction of the Mitchell Alternative, resulting in approximately 25.8 acres of surface disturbance.

Design Features Specific to the Mitchell Alternative

Fire Prevention and Response

FP 2. To protect forest resources and the transmission line from wildland fire, fuels reduction activities will take place along the transmission line. Fuels reduction activities will reduce canopy bulk density and interlocking crowns; remove ladder fuels; and increase the height to live crown on residual crowns. Treatment areas will occur within the 300 to 600 foot "variable-width corridor" where botanical and cultural baseline surveys have been conducted.

Trees will be thinned from below and any trees with evidence of disease or insect-infestation would be removed. Ladder fuels are described as any live or dead tree or shrub that would allow a fire to climb up from the landscape or forest floor into the tree canopy. Shrubs will also be removed from underneath the drip line of residual trees. In areas where the shrub canopy cover is greater than 60 percent outside the drip line of trees, 10 percent to 50 percent of the shrubs will be removed or mowed, leaving a mosaic pattern (e.g., 10 percent of the shrubs would be removed within a site with 60 percent shrub cover; 40 percent of the shrubs would be removed within in a site with 90 percent shrub cover).

1.3.2.2 Peavine Alternative

The Peavine Alternative would be approximately 10.3 miles long (**Figure 1**). The first approximately 5.0 miles and the last approximately 0.8 mile of the Peavine Alternative would be identical to the Mitchell Alternative. The Peavine Alternative generally parallels the California State line, staying on the Nevada side by approximately 0.6 to 0.9 mile. The last approximately 0.4 mile of the transmission line would be constructed within an existing utility corridor on

single pole structures as part of an under-build with an existing distribution line. Approximately 2.8 miles of the Peavine Alternative would be located adjacent to an existing power line corridor.

Approximately 20.8 miles of existing roads would be widened for construction access. **Table 1-6** presents the miles of road required to be widening and the surface disturbance associated with the widening.

Table 1-6 Road Widening Required for the Peavine Alternative

Road/Route Type	Widening Required (Miles)	Surface Disturbance (Acres)[1]
Designated NFS Roads on NFS Land	10.0	25.5
Non-Designated Routes on NFS Land	1.4	3.5
Existing Roads Across Private Land	9.5	24.3
Total (Roads/Routes on All Land):	20.8	53.3

[1] Does not include existing road disturbance, which is assumed to be 9 feet wide.

Approximately 7.5 miles of new temporary centerline travel roads would be needed for construction of the Peavine Alternative, resulting in approximately 27.3 acres of surface disturbance.

Design Features Specific to the Peavine Alternative

Fire Prevention and Response

FP 2. To protect forest resources and the transmission line from wildland fire, fuels reduction activities will take place along the transmission line. Fuels reduction activities will reduce canopy bulk density and interlocking crowns; remove ladder fuels; and increase the height to live crown on residual crowns. Treatment areas will occur within the 300 to 600 foot "variable-width corridor" where botanical and cultural baseline surveys have been conducted.

Trees will be thinned from below and any trees with evidence of disease or insect-infestation would be removed. Ladder fuels are described as any live or dead tree or shrub that would allow a fire to climb up from the landscape or forest floor into the tree canopy. Shrubs will also be removed from underneath the drip line of residual trees. In areas where the shrub canopy cover is greater than 60 percent outside the drip line of trees, 10 percent to 50 percent of the shrubs will be removed or mowed, leaving a mosaic pattern (e.g., 10 percent of the shrubs would be removed within a site with 60 percent shrub cover; 40 percent of the shrubs would be removed within in a site with 90 percent shrub cover).

1.3.2.3 Poeville Alternative

The Poeville Alternative would be approximately 18.0 miles long (**Figure 1**). Beginning at the Bordertown Substation, this alternative would parallel the Alturas 345 kV transmission line for approximately 6.7 miles and then follow the existing distribution power line toward the top of Peavine Peak. Construction of this section would consist of single pole structures with an under-build of the distribution line. East of Verdi, the Poeville Alternative would replace the existing, but currently inactive 60 kV #632 distribution line in its exact location, parallel with the existing #114 and #106 lines through Verdi to the California Substation. The existing #632 line H-frame pole structures would be replaced with new H-frame pole structures. Approximately 12.6 miles of the Poeville Alternative would be located adjacent to an existing power line corridor.

Approximately 24.2 miles of existing roads would be widened for construction access. **Table 1-7** presents the miles of road required to be widening and the surface disturbance associated with the widening.

Table 1-7 Road Widening Required for the Poeville Alternative

Road/Route Type	Widening Required (Miles)	Surface Disturbance (Acres)[1]
Designated NFS Roads on NFS Land	1.8	4.5
Non-Designated Routes on NFS Land	0.9	2.4
Existing Roads Across Private Land	21.5	55.1
Total (Roads/Routes on All Land):	24.2	62.0

[1] Does not include existing road disturbance, which is assumed to be 9 feet wide.

Approximately 5.4 miles of new temporary centerline travel roads would be needed for construction of the Poeville Alternative, resulting in approximately 19.6 acres of surface disturbance.

1.3.2.4 Peavine/Poeville Alternative

The Peavine/Poeville Alternative would be approximately 11.9 miles long (**Figure 1**). The first approximately 6.4 miles of the Peavine/Poeville Alternative would be the same as the first 6.4 miles of the Peavine Alternative. The last approximately 3.8 miles would be the same as the last 3.8 miles of the Poeville Alternative. A total of approximately 4.1 miles of the Peavine/Poeville Alternative would be located next to an existing power line corridor.

Approximately 26.1 miles of existing roads would be widened for construction access. **Table 1-8** presents the miles of road required to be widening and the surface disturbance associated with the widening.

Table 1-8 Road Widening Required for the Peavine/Poeville Alternative

Road/Route Type	Widening Required (Miles)	Surface Disturbance (Acres)[1]
Designated NFS Roads on NFS Land	8.9	22.6
Non-Designated Routes on NFS Land	0.0	0.0
Existing Roads Across Private Land	17.2	43.7
Total (Roads/Routes on All Land):	26.1	66.3

[1] Does not include existing road disturbance, which is assumed to be 9 feet wide.

Approximately 7.8 miles of new temporary centerline travel roads would be needed for construction of the Peavine/Poeville Alternative, resulting in approximately 28.4 acres of surface disturbance.

1.4 RESOURCE ISSUE STATEMENT

1.4.1 Vegetative Communities

Transmission line construction activities could directly impact vegetative communities.

Disturbance to vegetation would include: crushing and compaction caused by personnel and the operation of equipment, mowing, trimming, and removal, and disruption of the current plant succession regime.

1.4.2 Noxious and Invasive Weed Species

Transmission line construction activities could increase the potential for the introduction and spread of noxious and invasive plant species.

Surface disturbance associated with construction of the transmission line and temporary and permanent access roads could result in the spread of noxious and undesirable plant species. The potential also exists for increased risk of wildfire associated with cheatgrass invasion.

2.0 AFFECTED ENVIRONMENT

2.1 ANALYSIS AREAS

The affected environment refers to the existing vegetation resources within the analysis areas. An analysis area provides context for the resource effects that may occur from implementation of an alternative or action. The four analysis areas described below were developed in order to capture the effects on vegetation resources from implementation of the No Action Alternative or the action alternatives, as described in **Section 1.3** of this Specialist Report.

Analysis Area 1: Proposed ROW/Easement

The proposed ROW/easement analysis area consists of the approximately 3.7-acre proposed expansion of the Bordertown Substation and the proposed 90-foot-wide ROW and easements along the length of the proposed transmission line, as described in **Section 1.2**. Because the length of the proposed transmission would vary among each action alternative, the acreage of the proposed ROW/easement analysis area is unique to each alternative. **Table 1-4** lists the approximate acreage within the ROW/easement area for each alternative.

Analysis Area 2: Variable-Width Corridor

The variable-width corridor analysis area measures 150 to 300 feet on either side of the centerline of the proposed transmission line alignment of an action alternative, for a total width of 300 to 600 feet. The corridor is 300 feet wide where slopes are 10 percent or less, and widens to 600 feet where slopes are greater than 10 percent. On NFS land the corridor is generally 600 feet wide because of the prevalence of steeper slopes. The increased width of the corridor on steeper terrain accounts for larger construction disturbance that may be necessary when slopes are steep. Total area of the variable-width corridor is unique to each action alternative and ranges between approximately 669 and 965 acres.

For each action alternative, the variable-width corridor analysis area contains the entire proposed transmission line ROW and easements, and a portion of the proposed expansion area at the Bordertown Substation facility. All temporary new access roads (i.e., spur roads and centerline travel roads) and surface disturbance associated with transmission wire setup sites and pole sites would also be contained within the variable-width corridor analysis area.

Analysis area 3: Road Widening Corridor

The road widening corridor analysis area measures approximately 15 feet from either side of the centerline of existing roads and motorized trails that would be widened and used for project construction access, for a total width measuring approximately 30 feet. The 30-foot width takes into account any curve widening, turnouts, side cut and fill slope, and other surface disturbance required to increase the width of the existing traveled way to 14 feet. Existing roads and motorized trails that would be widened for access were assumed to be two-track roads or trails

with a traveled way measuring 9 feet wide. Sections of some existing roads and motorized trails that would be widened and used for construction access are within the variable-width corridor analysis area. The surface disturbance associated with widening these sections of the roads and trails would occur within the variable-width corridor analysis. The acreage of the road widening corridor analysis area is unique to each action alternative, and ranges between approximately 40 and 95 acres depending upon the alternative.

Analysis Area 4: 4-Mile Corridor

The 4-mile corridor analysis area consists of the area within 2 miles of either side of the centerline of the proposed transmission line alignment for each action alternative. The 4-mile corridor analysis area is used only for analysis of direct and indirect impacts related to noxious weeds and invasive species. The larger analysis area was used for noxious weeds and invasive species to allow for a broader picture of where current weed infestations occur and the risk of these infestations spreading to the variable-width corridor or road widening corridor analysis areas following project construction. Because the 4-mile corridor analysis area of each action alternative extends 2 miles in any direction from the centerline of the proposed transmission line, it overlaps the entire proposed ROW/easement and variable-width corridor analysis area of that alternative, as well as the majority of the road widening corridor analysis area. However, the variable-width corridor and road widening corridor analysis areas were also used for the analysis of noxious weeds and invasive species in order to capture the intensity of infestations that occur in areas where surface disturbance required for project construction would potentially occur.

2.2 DATA AND METHODS

2.2.1 Vegetation Cover

The analysis areas used for vegetation cover include the proposed ROW/easement, variable-width corridor, and road widening corridor (analysis areas 1 through 3). Existing vegetation was developed primarily from the Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) system for Zone 3, North Sierran (USFS 2008). The CALVEG system is commonly used by the USFS to classify existing vegetation cover into “vegetation alliances”. A vegetation alliance is a collection of plant species within a designated geographical unit, which forms a relatively uniform patch of vegetation cover, distinguishable from neighboring patches of different vegetation types. For purposes of this Specialist Report, vegetation alliances and vegetation communities are used synonymously.

On private land and public land portions of the Poeville and Peavine/Poeville Alternatives that were surveyed by JBR Environmental Consultants, Inc., vegetation cover within the variable width corridor analysis area was mapped during surveys that were conducted for special status plants and noxious and invasive weeds. Field surveys were necessary because the CALVEG dataset did not cover all private land within the analysis areas. Surveys were conducted in May

and July 2012. After the Stateline Alternative was dismissed and during the development of a new alignment for the Mitchell Alternative, JBR Environmental Consultants, Inc. performed additional surveys for vegetation cover, special status plants, and invasive species along the new sections of the Mitchell Alternative on June 10-13, 2013. Special status plants are addressed in *Revised Specialist Report: Special Status Plants: Bordertown to California 120 kV Transmission Line Project* (JBR Environmental Consultants, Inc. 2014).

Hand-held global positioning system (GPS) units with sub-meter accuracy, in combination with USGS quadrangle maps and aerial photography were used for field navigation. The hand-held GPS units were also used to locate and record field data. Where JBR Environmental Consultants, Inc. had GPS located vegetation communities during field surveys, which was generally on private land, the GPS located vegetation communities encountered in the field were used in place of the CALVEG communities. When applicable, areas of USFS plantations were also used in place of the vegetation communities developed from the CALVEG data. The extent of USFS plantation areas within the analysis area was generated from geographic information system (GIS) vector digital data (USFS 2013b). Characteristics of the planting areas were derived from descriptions from the *Dog Valley Fuels Reduction and Ecosystem Enhancement Project Environmental Assessment* (USFS 2009). Information pertaining to wildfires that have occurred within the analysis areas was obtained from California Department of Forestry and Fire Protection (2008) and the BLM (2007b).

2.2.2 Forest Product Resources

For the purpose of this Specialist Report, forest products resources consists of the forest products typically directly derived from lands within the analysis areas, including sawtimber, posts, poles, firewood, and Christmas trees. The analysis areas used for forest product resources includes the proposed ROW/easements, variable-width corridor, and road widening corridor (analysis areas 1, 2, and 3), as described in **Section 2.1**.

Existing timber management projects within the analysis area were obtained from GIS data produced by the USFS, Carson Ranger District. The data was initially created for the *Dog Valley Fuels Reduction and Ecosystem Enhancement Project Environmental Assessment* (USFS 2009). The CALVEG GIS data (USFS 2008), USFS plantation area GIS data (USFS 2013b), and vegetation communities field mapped by JBR Environmental Consultants, Inc., as described in **Section 2.2.1**, were also used to identify suitable timber management areas.

2.2.3 Noxious Weeds and Invasive Species

Noxious weeds are defined by the state of California in Chapter 1 of the Food and Agricultural Code, Section 5004, as “any species of plant that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate, which the director, by regulation, designates to be a noxious

weed." Noxious weeds are similarly defined by the state of Nevada in Chapter 555 of the Nevada Revised Statutes (NRS), Section 005 (NRS 555.005) as "any species of plant which is, or is likely to be, detrimental or destructive and difficult to control or eradicate. Noxious weeds are defined by the USFS in Forest Service Manual (FSM) 2080.5 as "those plant species designated as noxious weeds by the Secretary of Agriculture or by the responsible State official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage..."

Both the states of Nevada and California maintain noxious weed lists. The USFS incorporates the state lists as they apply to NFS land within each state. For purposes of the analysis presented in this specialist report, any species that is designated and published as a noxious weed on either state list was considered to be a noxious weed species, regardless of whether it occurs within California or Nevada. The noxious weed lists of California and Nevada are included in **Appendix A** of this specialist report.

Invasive species are defined by Executive Order (February 3, 1999) as: 1) any species nonnative to the ecosystem considered; and, 2) its introduction causes or is "likely to cause economic or environmental harm or harm to human health." Unlike noxious weeds, many invasive species are without a legal designation in both California and Nevada. However, the impact of these species on native ecosystems can be just as damaging as noxious weeds.

Invasive species are considered to be transformer species when they have the potential to form monoculture stands, and greatly alter disturbance regimes and ecosystem functions including productivity, trophic structure, and nutrient cycling. Invasive species that are considered potential transformer species for Sierra Nevada ecosystems have been identified by D'Antonio, Berlow, and Haubensak (2004). Cheatgrass (*Bromus tectorum*) is an invasive species that is identified as a transformer species (D'Antonio et al. 2004), and it is not designated on the noxious weed list of California or Nevada. Cheatgrass is a widespread threat to the native vegetation communities throughout the western United States and has been included for analysis. Other invasive species that have been included for analysis include those identified as occurring within the 4-mile corridor analysis area of one or more action alternative from one or more of the data sources listed below.

Baseline conditions for noxious weeds and invasive species within the analysis areas were derived from a combination of data sources. A field survey for noxious and invasive weed species was completed within the variable-width corridor analysis area in 2011 and 2012, as previously described in **Section 2.2.1**. Surveys were also completed by JBR Environmental Consultants, Inc. during 2013. Hand-held GPS units with sub-meter accuracy were used to record the location of noxious and invasive weeds observed during the pedestrian surveys. Numerous agencies were contacted and several websites were used to compile the best possible

record of noxious and invasive weed occurrences within the remaining portions of the 4-mile corridor analysis area, as well as the variable-width corridor portion that was surveyed. The agency and website sources that were consulted included the following:

- BLM, Carson City Field Office;
- BLM, Eagle Field Office;
- California Department of Food and Agriculture (CDFA);
- California Invasive Plant Council (Cal-IPC);
- USFS, Carson Ranger District;
- Nevada Division of Wildlife;
- Nevada Department of Agriculture;
- Nevada Natural Heritage Program;
- Nevada Land Trust; and
- Washoe County Department of Regional Parks and Open Space.

GIS data and maps available from the Nevada Natural Heritage Program (2004; 2011), Truckee Meadows Weed Coordinating Group (2007a; 2007b; 2007c), Cal-IPC (2013), The Calflora Database (2012), and University of Georgia, Center for Invasive Species and Ecosystem Health (2013) were also used to compile existing baseline conditions for noxious weeds. A complete list of the sources that were consulted for this specialist report can be found in **Section 4.0**.

2.2.4 Herbicide Use

Much of the information from this analysis is taken from *Eradication and Control of Invasive Plants Environmental Assessment* (USFS 2013a) completed for the Eldorado National Forest forest-wide noxious and invasive weed control program. The use of herbicides was a key component of the Eldorado National Forest weed control program and the Environmental Analysis document contained an analysis of the effects of the specific herbicides would have on environmental resources, including vegetation, wildlife, soils, and human health. To assess the effects of herbicide use on the Eldorado National Forest, the USFS relied primarily on herbicide risk assessments modeled by Syracuse Environmental Research Associates, Inc. (SERA) (SERA 2004a; 2004b; 2004c; 2007; 2011a; 2011b).

The use of the *Eradication and Control of Invasive Plants Environmental Assessment* (USFS 2013a) and concurrence with its conclusions regarding the effects of herbicides is reasonable and appropriate because the type of herbicide, herbicide formulation, treatment methods, and eradication goals that would be used for the proposed project was analyzed in the document. Additionally, the soil types, vegetation communities, wildlife and associated habitats, and climatic conditions of the proposed project region are within the range of environmental

conditions experienced on the Eldorado National Forest and analyzed in the *Eradication and Control of Invasive Plants Environmental Assessment* (USFS 2013a).

Rather than place the analysis of the effects of herbicide use into several separate specialist reports, the analysis is contained in its entirety in this specialist report. As such, the following analysis not only evaluates effects to vegetation, but also effects to wildlife, soils, and human health.

2.3 REGULATORY FRAMEWORK

2.3.1 Humboldt-Toiyabe National Forest

The NFS land within the various analysis areas are located within the Humboldt-Toiyabe National Forest and are managed by the Carson Ranger District in accordance with all applicable federal laws and regulations, including the National Forest Management Act of 1976 and the Forest and Rangeland Renewable Resources Planning Act of 1974. Management is further governed by the 1986 *Toiyabe National Forest Land and Resource Management Plan* (Forest Plan) (USFS 1986).

The Forest Plan provides standards and guidelines for each resource on a Forest-wide basis. The Forest Plan also defines 12 distinct management areas into which the Forest is divided and provides specific resource standards and guidelines for each area. Each of the 4 analysis areas is partially located within the Dog Valley Management Area or on NFS land that were acquired after the Dog Valley Management Area and Forest Plan were established. These acquisitions are located east of the Dog Valley Management Area. The Forest Plan outlines the following proposed and probable management practices that affect vegetation resources for the Dog Valley Management Area:

- Treat noxious weeds;
- Manage timber stands to maintain vigor, control insects and disease, maintain aesthetics, and reduce fire hazard;
- Consider visual quality, wildlife, site productivity and economics as an important factors in all vegetation management prescriptions; and
- Place priority on harvest in high-risk old growth and overstocked intermediate Jeffrey pine vegetation types.

2.3.2 Sierra Nevada Forest Plan Amendment

Management of the NFS land within the analysis areas is further governed by the 2004 *Sierra Nevada Forest Plan Amendment: Final Supplemental Environmental Impact Statement* (USFS 2004b). The Sierra Nevada Forest Plan Amendment (SNFPA) amends the forest plans for a

number of national forests in the Sierra Nevada and Modoc Plateau to address five problem areas:

- Old forest ecosystems and associated species;
- Aquatic, riparian, and meadow ecosystems and associated species;
- Fire and fuels management;
- Noxious weeds; and
- Lower west side hardwood forest ecosystems.

To protect vegetation resources, specific standards for mechanical thinning treatments are stated in the SNFPA. Vegetation standards for mechanized thinning, snag retention, and salvage harvests that apply to the proposed project include the following:

- Retain all live conifers with a 30-inch dbh or larger wherever possible;
- Retain three of the largest snags per acre of treatment wherever possible;
- Promote shade intolerant species such as Jeffrey and Ponderosa pines;
- Design projects to reduce potential soil erosion and the loss of soil productivity caused by loss of vegetation and ground cover;
- Provide for adequate soil cover in the short term;
- Maintain existing and provide for additional large woody material and ground cover as needed for wildlife;
- Provide for a mix of seral stages over time;
- Accelerate dispersal of coarse woody debris;
- Accelerate development of mature forest habitat through reforestation and other cultural means;
- Avoid areas where forest vegetation is still largely intact;
- Manage the development of fuel profiles over time;
- Recover the value of timber removed, by minimizing harvest costs; and
- Re-vegetation of lands impacted by channel changes shall be done with available native plants and appropriate non-native plants.

The SNFPA goals for the management of noxious weeds are to manage weeds using an integrated weed management approach according to the priority set forth in FSM 2081.2:

- **Priority 1**. Prevent the introduction of new invaders.
- **Priority 2**. Conduct early treatment of new infestations.
- **Priority 3**. Contain and control established infestations.

Specific standards from the SNFPA regarding noxious weeds management that apply to the proposed project include the following:

- Prevent and control noxious weed infestations following measures outlined in the Regional Noxious Weed Management Strategy (USFS 2000);
- Conduct a noxious weed risk assessment to determine risks for weed spread;
- Follow regional weed prevention practices and develop mitigation measures for high and moderate risk activities;
- Require off-road equipment and vehicles to be weed free;
- Conduct follow-up inspections of ground disturbances for weeds for two years following project completion;
- Complete noxious weed inventories and update on an annual basis;
- Emphasize eradication of small infestations; and
- Monitor all weed control treatments to evaluate need for follow-up treatments and determine changes in weed density and rate of spread if necessary.

2.3.3 Bureau of Land Management Eagle Lake Field Office

Portions of the analysis areas occur on public land administered by the BLM Eagle Lake Field Office. According to the Key Management Actions of the *Eagle Lake Field Office Proposed Resource Management Plan and Final Environmental Impact Statement* (BLM 2007a) and the *Record of Decision* (BLM 2008), the following goals and objectives are provided for vegetation resources:

- Apply sediment intrusion buffer zones of 50 feet or greater around sensitive resources on a case-by-case basis.
- Use locally gathered native seed when re-seeding, where possible.
- Use integrated weed management procedures on all BLM-administered public land. Conduct inventory of noxious weeds and monitor treatment sites.
- Control cheatgrass, invasive juniper, and noxious weeds to improve habitat conditions.
- Create healthy forest ecosystems in all seral stages that are ecologically stable, support natural watershed function, and supply the needs of wildlife. Conditions would be such that wildfires are controllable (i.e., forests would approximate original, natural conditions) and human needs for recreation, wood products, and other objectives are adequately addressed.
- Soils should be protected where they meet land health standards. Site stability and/or soil productivity would be substantially improved where soils do not meet these standards.
- Vegetation would achieve and maintain its capacity to support natural function and biotic integrity within the context of normal variability. Therefore, plant communities would be

sufficiently resilient to resist loss of structure and function resulting from disturbance and adequately recover following such events.

- Monitor effectiveness of treatments in rare vegetation communities (e.g., Quaking Aspen, and Curl-Leaf Mountain Mahogany communities) that undergo restoration treatments.
- Maintain, restore, or improve riparian vegetation, habitat diversity, and hydrologic stability to achieve healthy, productive riparian areas and wetlands.
- Eliminate or control noxious weeds, invasive species, and poisonous plants to preserve or improve wildlife habitat, fore and rangeland productivity and land health generally.
- Known infestations will be evaluated annually and integrated weed management techniques will be applied as necessary.
- Monitor weed treatment sites to determine effects on target species, effects on non-target species, and assess recover or invasion by other species.
- Conduct annual monitoring for new noxious weeds, concentrating in areas where ground disturbing activities have occurred, and where the public or agency personnel have reported sightings. Visit known noxious weed sites which are identified for treatment, and evaluate for effectiveness of control (annually). For all known sites and any newly discovered sites, record with a GPS unit, photograph, measure, and determine the need for future treatment.

2.4 VEGETATION COMMUNITIES

Twenty-five general vegetation communities were identified within the analysis areas, but similar communities were combined, leaving a total of 17 within the analysis areas. Areas that were identified as barren land or as urban and developed land were not considered vegetation communities. The extent of the vegetation communities mapped within the analysis areas for all action alternatives is displayed on **Figures 2A** through **2G**.

The total acreage of vegetation communities within the proposed ROW/easement area, variable-width corridor and road widening corridor analysis area for each action alternative are listed in **Tables 2-1, 2-2, and 2-3**. The table also lists the acres of each community that are located specifically on NFS land for each analysis area. The total acreage of each community located on BLM-administered public land and private land within the variable-width corridor and road widening corridor analysis areas is provided in **Table 2-4**. Forest communities (i.e., Eastside Pine, Jeffrey Pine, Mixed Conifer-Fir, Plantation, and Quaking Aspen vegetation communities) are listed first in each of the tables. The remaining communities are listed in alphabetical order after the forest communities.

Brief descriptions of the vegetation communities within the variable-width corridor and road widening corridor analysis areas are included in **Section 2.4.1**. It is important to note that the acreages listed in **Tables 2-1** through **2-4** represent only existing vegetation conditions and do

not represent any level of disturbance. The current conditions of most of the vegetation communities range from moderately to significantly disturbed. Disturbances that have influenced or shaped the vegetation communities within the analysis areas are discussed in **Section 2.4.2**.

Table 2-1 Vegetation Communities within the Transmission Line ROW/Easement

Vegetation Community	Mitchell Alternative		Peavine Alternative		Poeville Alternative		Peavine/Poeville Alternative	
	NFS Land (Acres)	Total (Acres)	NFS Land (Acres)	Total (Acres)	NFS Land (Acres)	Total (Acres)	NFS Land (Acres)	Total (Acres)
Eastside Pine	23.1	23.7	14.6	15.3	0.0	0.1	6.1	6.3
Jeffrey Pine	0.0	2.3	0.1	2.4	0.0	1.6	1.9	3.9
Mixed Conifer-Fir	3.6	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Plantation	9.9	9.9	2.6	2.6	0.0	0.0	0.0	0.0
Quaking Aspen	2.3	2.3	1.1	1.1	0.0	1.2	1.1	1.9
Annual Grasses and Forbs	2.2	2.3	2.5	2.6	0.0	52.2	0.2	30.7
Big Sagebrush	0.0	3.7	0.0	3.8	1.2	11.5	0.0	3.8
Bitterbrush-Sagebrush	25.0	48.1	33.3	56.4	36.1	81.0	20.4	51.9
Chaparral	15.1	15.1	14.5	14.5	1.5	1.8	13.7	15.1
Curl-Leaf Mountain Mahogany	0.9	0.9	1.5	1.5	1.0	1.7	1.1	1.1
Great Basin Mixed Scrub	7.3	7.3	4.7	4.7	0.0	8.8	0.0	0.0
Low Sagebrush	1.0	2.3	0.9	2.2	0.3	0.7	1.5	3.7
Mountain Sagebrush	0.0	0.0	0.0	0.0	1.7	2.4	0.0	0.0
Ruderal	0.2	2.0	0.2	2.0	2.1	20.2	0.0	4.6
Snowbrush	0.5	0.7	0.5	0.7	0.0	0.9	0.5	0.7
Wet Meadow	0.0	2.3	0.0	2.3	0.0	0.8	0.0	3.0
Willow	0.0	0.2	0.0	0.2	0.3	1.7	0.1	1.5
TOTALS:	**91.1**	**126.7**	**76.5**	**112.3**	**44.2**	**186.6**	**46.6**	**128.2**

Source: USFS (2008; 2013b) and data from pedestrian surveys completed between 2011 and 2013.

Table 2-2 Vegetation Communities within the Variable-Width Corridor

Vegetation Community	Mitchell Alternative		Peavine Alternative		Poeville Alternative		Peavine/Poeville Alternative	
	NFS Land (Acres)*	Total (Acres)*	NFS Land (Acres)*	Total (Acres)*	NFS Land (Acres)*	Total (Acres)*	NFS Land (Acres)*	Total (Acres)*
Eastside Pine	140.0	145.4	83.7	87.6	0	0.6	42.2	42.8
Jeffrey Pine	0.2	11.7	0.8	12.2	0.1	10.3	12.6	25.2
Mixed Conifer-Fir	18.1	18.1	0	0	0	0	0	0

Vegetation Community	Mitchell Alternative		Peavine Alternative		Poeville Alternative		Peavine/Poeville Alternative	
Plantation	66.2	66.5	17.5	17.7	0	0	0	0
Quaking Aspen	12.8	12.8	6.1	6.1	0.0	5.9	6.4	9.1
Annual Grasses and Forbs	19.7	20.9	17.7	18.9	0.9	319.5	8.9	176.3
Big Sagebrush	0	19.0	0.7	19.7	3.9	39.5	0.7	19.5
Bitterbrush-Sagebrush	170.9	271.4	228.6	330.8	143.2	336.3	127.9	247.4
Chaparral	97.0	99.8	92.7	94.8	8.3	13.4	90.9	98.3
Curl-Leaf Mountain Mahogany	4.7	4.7	7.8	7.8	11.0	14.8	6.0	6.0
Great Basin Mixed Scrub	49.1	49.1	27.3	28.9	0.1	58.7	0	0.0
Low Sagebrush	4.2	10.5	5.7	12.0	3.0	5.9	10.4	22.0
Mountain Sagebrush	0	0.9	0	0.9	9.7	18.1	0	0.9
Ruderal	0.4	4.9	0.5	4.9	11.0	87.4	0	16.6
Snowbrush	9.8	15.9	6.2	12.3	0.8	5.0	6.2	12.3
Wet Meadow	0.5	10.8	0	10.3	0	2.9	0	12.4
Willow	0.1	2.9	0.1	2.9	3.9	8.8	1.1	6.9
TOTALS:*	**593.7**	**765.3**	**495.4**	**668.5**	**195.9**	**927.1**	**313.3**	**695.7**

Source: USFS (2008; 2013b) and data from pedestrian surveys completed between 2011 and 2013.

* Includes vegetation communities within the transmission line ROW/easement.

Table 2-3 Vegetation Communities within the Road Widening Corridors

Vegetation Community	Mitchell Alternative		Peavine Alternative		Poeville Alternative		Peavine/Poeville Alternative	
	NFS Land (Acres)*	Total (Acres)*	NFS Land (Acres)*	Total (Acres)*	NFS Land (Acres)*	Total (Acres)*	NFS Land (Acres)*	Total (Acres)*
Eastside Pine	4.1	4.2	6.9	8.2	0.0	0.1	3.5	4.8
Jeffrey Pine	0.0	0.2	0.0	0.2	0.0	0.3	0.0	0.0
Mixed Conifer-Fir	0.2	0.2	0.4	0.4	0.0	0.0	0.2	0.2
Plantation	0.0	0.0	1.3	1.3	0.0	0.0	0.0	0.0
Quaking Aspen	0.8	0.8	0.8	0.8	0.0	0.8	0.8	1.0
Annual Grasses and Forbs	0.0	1.2	0.4	3.4	0.3	7.8	0.3	4.4
Big Sagebrush	0.0	0.2	0.0	0.3	0.0	0.8	0.0	0.4
Bitterbrush-Sagebrush	4.1	10.3	12.9	25.8	4.5	29.8	11.1	28.1
Chaparral	0.7	0.7	1.2	1.2	0.5	3.0	1.1	3.0
Curl-Leaf Mountain Mahogany	0.0	0.0	0.0	0.2	0.2	0.2	0.0	0.2
Great Basin Mixed Scrub	0.1	0.2	0.0	0.1	0.0	2.5	0.0	2.3
Low Sagebrush	0.0	0.0	0.3	0.4	0.1	0.1	0.0	0.0
Mountain Sagebrush	0.5	0.7	0.5	0.7	1.2	2.8	1.3	3.0
Ruderal	0.0	0.2	0.0	2.6	0.0	10.5	0.0	8.1

Vegetation Community	Mitchell Alternative		Peavine Alternative		Poeville Alternative		Peavine/Poeville Alternative	
Snowbrush	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Wet Meadow	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0
Willow	1.0	1.0	1.1	1.3	0.0	0.1	1.1	1.3
TOTALS:*	**11.5**	**20.0**	**25.8**	**47.0**	**6.8**	**59.0**	**19.4**	**56.9**

Source: USFS (2008; 2013b) and data from pedestrian surveys completed between 2011 and 2013.
*Does not include vegetation communities within portions of the road widening corridor analysis area located inside of the variable-width corridor analysis area.

Table 2-4 Vegetation Communities on BLM and Private Land Within Analysis Areas*

Vegetation Community	Mitchell Alternative		Peavine Alternative		Poeville Alternative		Peavine/Poeville Alternative	
	BLM (Acres)	Private (Acres)	BLM (Acres)	Private (Acres)	BLM (Acres)	Private (Acres)	BLM (Acres)	Private (Acres)
Eastside Pine	0.0	5.5	0.0	5.2	0.0	0.7	0.0	1.9
Jeffrey Pine	0.0	11.7	0.0	11.6	0.0	10.5	0.0	12.5
Mixed Conifer-Fir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plantation	0.0	0.3	0.0	0.2	0.0	0.0	0.0	0.0
Quaking Aspen	0.0	0.0	0.0	0.0	0.0	6.7	0.0	2.8
Annual Grasses and Forbs	0.0	2.4	0.0	4.2	0.0	326.1	0.0	171.5
Big Sagebrush	0.0	19.2	0.0	19.2	0.0	36.4	0.0	19.2
Bitterbrush-Sagebrush	15.0	91.7	15.0	100.1	15.0	203.4	15.0	121.6
Chaparral	0.0	2.8	0.0	2.1	0.0	7.6	0.0	9.3
Curl-Leaf Mountain Mahogany	0.0	0.0	0.0	0.2	0.0	3.8	0.0	0.2
Great Basin Mixed Scrub	0.0	0.1	0.0	1.7	0.0	61.1	0.0	2.3
Low Sagebrush	0.0	6.3	0.0	6.4	0.0	2.9	0.0	11.6
Mountain Sagebrush	0.0	1.1	0.0	1.1	0.0	10.0	0.0	2.6
Ruderal	0.0	4.7	0.0	7.0	0.0	86.9	0.0	24.7
Snowbrush	0.0	6.1	0.0	6.1	0.0	4.3	0.0	6.2
Wet Meadow	0.0	10.4	0.0	10.4	0.0	3.0	0.0	12.4
Willow	0.0	2.8	0.0	3.0	0.0	5.0	0.0	6.0
TOTALS:	**15.0**	**165.1**	**15.0**	**178.5**	**15.0**	**768.4**	**15.0**	**404.8**

Source: USFS (2008; 2013b) and data from pedestrian surveys completed between 2011 and 2013.
*Combines acreage from variable-width and road widening corridor analysis areas.

2.4.1 Vegetation Community Descriptions

Eastside Pine Community

The Eastside Pine community is typically found at elevations of 5,000 to 7,000 feet above mean sea level (AMSL) (USFS 2008). On the eastside of the northern Sierra Nevada, Jeffrey pine (*Pinus jeffreyi*) and Ponderosa pine (*Pinus ponderosa*) are co-dominant overstory species of the Eastside Pine community. The understory is characterized by Great Basin shrubs, forbs and

grasses such as big sagebrush (*Artemisia tridentata*), antelope bitterbrush (*Purshia tridentata*), curl-leaf mountain mahogany (*Cercocarpus ledifolius*), Bloomer's goldenbush (*Ericameria bloomeri*), mule-ears (*Wyethia mollis*), arrowleaf balsamroot (*Balsamorhiza sagittata*), Idaho fescue (*Festuca idahoensis*) and wildrye grasses (*Elymus* spp.). When these taxa are not present onsite or in the immediate vicinity, the community is defined by either Ponderosa pine or Jeffrey pine. Sierra juniper (*Juniperus occidentalis*) may also be found in trace amounts in this vegetation community.

The Eastside Pine community occurs within the variable-width and road widening corridor analysis areas of each of the action alternatives. However, the community is generally found west of Peavine Peak, and is more common within the analysis areas of the Mitchell and Peavine Alternatives (**Figures 2A** through **2G**). Within the analysis areas, Jeffrey pine is the dominant canopy species, but a few Ponderosa pines are also present. Curl-leaf mountain mahogany is present in patches and various shrubs such as mountain sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and snowbrush (*Ceanothus velutinus*) are present in the understory.

Jeffrey Pine Community

The Jeffrey Pine community dominates the middle elevations of the west and north aspects of Peavine Mountain (Nachlinger 1992). The overstory consists almost exclusively of Jeffrey pine. Shrub species such as big sagebrush, bitterbrush, pallid serviceberry (*Amelancier pallida*), greenleaf manzanita (*Arctostaphylos patula*), squaw carpet (*Ceanothus prostratus*), Bloomer's goldenbush, desert gooseberry (*Ribes velutinum*), and mountain snowberry (*Symphoricarpos rotundifolius*) are present in the understory. Perennial forbs and grasses present in the understory include Sandberg bluegrass (*Poa secunda*), Wheeler's bluegrass (*Poa wheeleri*), mule-ears, arrowleaf balsamroot, yarrow (*Achillea millefolium*), lupine (*Lupinus* spp.), and Ross' sedge (*Carex rossii*). The Jeffrey Pine community occurs adjacent to and merges with the Eastside Pine community as Great Basin species become more prominent in the understory, including big sagebrush or mountain sagebrush, curl-leaf mountain mahogany, and bitterbrush.

The Jeffrey Pine community occurs at one location within the variable-width corridor analysis areas of the Mitchell, Peavine, and Peavine/Poeville Alternatives in Long Valley. The community also occurs within the variable-width corridor analysis area of the Peavine/Poeville Alternative at a second location east of Mitchell Canyon (**Figures 2A** through **2G**).

Mixed Conifer-Fir Community

The Mixed Conifer-Fir community occurs at elevations up to approximately 7,800 feet AMSL on west and north slopes typically on eastside of the Sierra Nevada. The Mixed Conifer-Fir community has been mapped widely and very abundantly in 11 subsections of CALVEG Zone 3, and less frequently in 7 others. Three major species define the community: white fir (*Abies concolor*), Jeffrey pine, and/or lodgepole pine (*Pinus contorta* ssp. *murrayana*). Upper elevation

and Great Basin shrubs are often found on or next to these locations, including greenleaf manzanita, huckleberry oak (*Quercus vaccinifolia*), curl-leaf mountain mahogany, snowbrush, mountain alder (*Alnus incana* ssp. *tenuifolia*), mountain sagebrush, and bitterbrush. Willows (*Salix* ssp.) and quaking aspen (*Populus tremuloides*) are also likely to occur on these sites.

The Mixed Conifer-Fir community occurs within the variable-width corridor analysis area of the Mitchell Alternative near Mitchell Canyon, and in the road widening corridor analysis area of the Peavine Alternative, also near Mitchell Canyon (**Figures 2A** through **2G**).

Plantation Community

After wildland fires, tree plantations were established to re-forest burned areas. There are two types of forest plantations that occur on the NFS land at elevations ranging from 5,100 feet to 6,250 feet AMSL (USFS 2013b). The first type is considered to be older plantations that were planted in the late 1950's and 1960's following wildfires. Trees in the older plantations generally range from 8 to 20 inches dbh, are 10 to 40 feet tall and have a dense brush component that occurs with them. The second type of plantation has been established more recently after fires in the 1980's and 1990's (USFS 2010a). In the younger plantations, trees range from 2 to 10 feet in height and have a dense brush component to compete with. Many of the plantations were planted with Jeffrey pine and Ponderosa pine seedlings using an 8-foot by 8-foot spacing. Some more recent plantations were planted using a 10-foot by 10-foot spacing and other older areas were direct seeded with Jeffrey pine. Sugar pine (*Pinus lambertiana*) was also planted within some plantations, though seedlings were not tested as rust resistant. Natural recruitment also occurs in the plantations (USFS 2009). Establishment of plantations has been predominantly successful within the area, although a few areas were planted again at a later date (USFS 2013b) and some were considered failures. Tree ages range from 15 to 60 years and some trees are infected with western dwarf mistletoe (*Arceuthobium campylopodum*) (USFS 2009).

The Plantation community is found at several locations within the variable-width and road widening corridor analysis areas of the Mitchell and Peavine Alternatives. Within the analysis areas, the community occurs almost exclusively within California (**Figures 2A** through **2G**).

Quaking Aspen Community

Quaking aspen, a deciduous hardwood with an extensive range in the Western Hemisphere, has been mapped in widely scattered areas throughout the Sierra Nevada and Great Basin (USFS 2008). It occurs in pure stands or as scattered individuals throughout moist areas and has been mapped on Peavine Mountain at elevations about 5,000 to 7,600 feet AMSL. On uplands, it is commonly associated with conifer species such as red fir (*Abies magnifica*), white fir and lodgepole pine. Willow, Fremont's cottonwood (*Populus fremontii*), black cottonwood (*Populus balsamifera*), mountain alder, and Woods' rose (*Rosa woodsii*) are often found within the Quaking Aspen community. Great Basin shrubs such as mountain sagebrush, mountain

snowberry, bitter cherry (*Prunus emarginata*) can also be present in the understory on more xeric sites (Nachlinger 1992). Understory forbs and graminoids associated with Quaking Aspen community are similar to those found within the Willow community.

For purposes of this analysis, the Quaking Aspen community also includes areas that have been mapped as Riparian Mixed Hardwood community. The Riparian Mixed Hardwood community consists of a mixture of riparian hardwood species with no particular species being clearly dominant. The hardwood mixture typically includes combinations of quaking aspen, willow, mountain alder, and black cottonwood (USFS 2008). There was no more than 2.4 acres of Riparian Mixed Hardwood community within the variable-width corridor analysis area of any action alternative, and the species composition is similar to the Quaking Aspen community.

The Quaking Aspen community occurs within the variable-width corridor and road widening corridor analysis areas of each action alternative (**Figures 2A** through **2G**). Generally, most occurrences within the road widening corridor analysis areas are along Bull Ranch Creek on the west-southwest aspect of Peavine Mountain. Occurrences mapped within the variable-width corridor analysis areas of the Mitchell, Peavine, and Peavine/Poeville Alternatives are associated with a tributary to Bull Ranch Creek. Within the variable-width corridor of the Poeville Alternative, the community occurs at a single location on the east of aspect of Peavine Mountain. Quaking aspen stands were also observed during field surveys by JBR Environmental Consultants, Inc. along the Truckee River and at scattered locations on Peavine Mountain along perennial creeks and around seeps.

Annual Grasses and Forbs Community

On Peavine Mountain, the Annual Grasses and Forbs community occurs at lower elevations, most commonly on more arid slopes and flats with a southerly aspect. The community is generally dominated by cheatgrass, an invasive species, as well as other non-natives or noxious weeds, such as medusahead (*Taeniatherum caput-medusae*). The Annual Grass and Forbs community often occurs as a direct result of wildfire or over-grazing within Eastside Pine or Mixed Conifer-Fir communities or in areas dominated by sagebrush (*Artemisia* spp.).

The Annual Grasses and Forbs community occurs within the variable-width and road widening corridor analysis areas of each of the action alternatives. However, the community is prevalent on the south aspect of Peavine Mountain within the boundary of a 2006 wildfire, and is therefore more common within the analysis areas of the Poeville and Peavine/Poeville Alternatives (**Figures 2A** and **2G**). In the area that burned, seeded perennial grass species such as crested wheatgrass (*Agropyron cristatum*) and wildrye are also present, but only compose 5 percent to 15 percent of the herbaceous cover. Areas burned in older wildfires in the northern and western areas of the analysis areas have mostly converted to the native vegetation communities.

Big Sagebrush Community

Big sagebrush has not been differentiated into subspecies within the Big Sagebrush community. Sagebrush within the community includes basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), mountain sagebrush, and Wyoming sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) (USFS 2008). On Peavine Mountain and its environs, the vegetation community has been mapped on dry slopes and plains from about 4,000 to 6,000 feet AMSL. Forbs and graminoids associated with the Great Basin Mixed Scrub community can also be found in the Big Sagebrush community.

Big Basin Sagebrush and Rabbitbrush vegetation communities were incorporated into the Big Sagebrush vegetation community for purposes of this analysis. Dominant species within the Big Basin Sagebrush and Rabbitbrush vegetation communities are similar to those found in the Big Sagebrush vegetation community. The Big Sagebrush vegetation community also includes the areas mapped by JBR Environmental Consultants, Inc. as altered andesitic soil sites dominated by sagebrush, grasses, and buckwheat (*Eriogonum* spp.). All of these areas comprised less than 1 acre of the variable-width corridor and road widening corridor analysis areas of the action alternatives where it occurred. Locations where Big Sagebrush community occurs within the analysis areas are displayed on **Figure 2A** through **2G**.

Bitterbrush-Sagebrush Community

On eastside slopes of the northern Sierra Nevada, bitterbrush and upland sagebrushes (such as basin big sagebrush and mountain sagebrush) occasionally mix where the combination of the two genera has dominance of the shrub layer, forming the Bitterbrush-Sagebrush community (USFS 2008). The community is spatially associated most commonly with the Eastside Pine and the Mountain Sagebrush vegetation communities. On Peavine Mountain, the Bitterbrush-Sagebrush vegetation community is mostly present on the mid-elevation slopes down into the surrounding flats.

The Bitterbrush vegetation community was incorporated into the Bitterbrush-Sagebrush Community because of its similarity and because no alternative had more than 1 acre of Bitterbrush community mapped within its variable-width or road widening corridor analysis areas. The Bitterbrush community is usually found on flat or gentle slopes in the vicinity of the Mountain Sagebrush community and/or adjacent to the Eastside Pine, Jeffrey Pine and Bitterbrush-Sagebrush communities (USFS 2008). Bitterbrush is a high value forage species and is also associated with grasses in open stands such as squirreltail (*Elymus elymoides*) and other wildrye grasses, fescue (*Festuca* spp.), and Sandberg bluegrass. Mountain sagebrush, bitterbrush, Anderson's peach (*Prunus andersonii*), and snowberry are often found within the Bitterbrush vegetation community. Grass and forbs species associated with the Mountain Sagebrush, Bitterbrush-Sagebrush, and Great Basin Mixed Scrub communities are also found within the Bitterbrush community.

The Bitterbrush-Sagebrush vegetation community is abundant within the variable-width corridor and road widening corridor analysis areas of each action alternative (**Figures 2A** and **2G**). However, the community is less abundant in portions of the analysis areas of the Poeville and Peavine/Poeville Alternatives that are located on the south aspect of Peavine Mountain. It is possible that Bitterbrush-Sagebrush community was more abundant on the south-facing slopes of Peavine Mountain at elevations above 6,500 feet AMSL, but most of this area was burned in 2006.

Chaparral Community

The Great Basin-Mixed Chaparral Transition community and the Upper Montane Mixed Chaparral community were grouped for purposes of this analysis, forming the Chaparral vegetation community. Both communities share many common species and are very similar to one another. The Great Basin-Mixed Chaparral Transition community, an eastside community, is a mixture of montane chaparral species such as snowbrush, greenleaf manzanita, bitter cherry, chokecherry (*Prunus virginiana*), and snowberry with an equivalent vegetation cover of Great Basin shrub species such as mountain sagebrush, low sagebrush (*Artemisia arbuscula*), desert gooseberry and bitterbrush (USFS 2008; Nachlinger 1992). The Upper Montane Mixed Chaparral community may also include mountain sagebrush and bitterbrush, but the more xeric Great Basin shrub species are typically not present.

The Chaparral community is sometimes associated with conifer plantations or open areas within the Eastside Pine or Jeffrey Pine communities, or on north aspects of slopes that collect more snow during the winter months. This transitional community has been identified mainly at mid- to upper-montane elevations of about 6,000 to 7,800 feet AMSL. The Chaparral community often forms a closed canopy with few understory forbs and graminoids.

The Chaparral community occurs within the variable-width corridor and road widening corridor analysis areas of each action alternative, but is far less abundant within the variable-width corridor analysis area of the Poeville Alternative (**Figures 2A** through **2G**). Within the Poeville Alternative variable-width corridor analysis area, the community occurs at a single location on the east aspect of Peavine Mountain. Within the variable-width corridor analysis areas of the other action alternatives, Chaparral community most commonly occurs in areas north of Mitchell Canyon. Throughout the analysis areas, the community is most often associated with northerly aspects and topographic draws.

Curl-leaf Mountain Mahogany Community

Curl-leaf mountain mahogany may adapt a shrub form or a small tree form that occurs in dense thickets. Where the shrub form of curl-leaf mountain mahogany is present, the community occurs on gently to steeply sloping mountain uplands and ridge tops usually in association with rocky outcrops. The percent cover by curl-leaf mountain mahogany can be low, less than 30

percent, or relatively high at almost 70 percent. Where canopy cover is high, there are few understory shrub species. Where canopy cover is lower common understory species include mountain sagebrush, snowbrush, yellow rabbitbrush (*Chrysothamnus viscidiflorus*), rubber rabbitbrush (*Ericameria nauseosa*), Mormon tea (*Ephedra viridis*), sulphur-flower buckwheat (*Eriogonum umbellatum*), bitterbrush, desert gooseberry, and spineless horsebrush (*Tetradymia canescens*). Herbaceous perennials and grasses are similar to those found in the Mountain Sagebrush community (Nachlinger 1992).

Although the shrub form is more commonly identified, the single-stemmed tree form of curl-leaf mountain mahogany has been mapped occasionally as a dominant hardwood in the northern and eastern sections of the Tahoe-Truckee and Carson Range Subsections of CALVEG Zone 3. The elevation range for the tree form is approximately 5,000 to 8,800 feet AMSL. On more mesic sites, associates may include scattered Ponderosa pine, Jeffrey pine, or lodgepole pine.

Curl-leaf Mountain Mahogany community occurs within the variable-width corridor analysis area of each action alternative and the widening corridor analysis areas of the Peavine and Peavine/Poeville Alternatives (**Figures 2A** through **2G**). Within the vicinity of the proposed project, curl-leaf mountain mahogany occurs at elevations as low as 5,500 feet AMSL on the north slope of Peavine Mountain and at isolated locations near the Bordertown Substation facility. The community also occurs on all aspects of Peavine Mountain at elevations above 6,500 feet AMSL.

Great Basin Mixed Scrub Community

A mixture of shrub species common to the Great Basin, but in which no single species is dominant defines the Great Basin Mixed Scrub community. It is a common eastside community at elevations ranging from about 5,000 to 7,600 feet AMSL (USFS 2008). The mixture of species often includes mountain sagebrush, bitterbrush, Anderson's peach, pallid serviceberry, rabbitbrush species, spineless horsebrush, Mormon tea, desert gooseberry, and other shrubs (Nachlinger 1992). Common forbs and graminoids include squirreltail, Sandberg bluegrass, threadleaf sedge (*Carex filifolia*), needlegrass (*Stipa* spp.), Torrey's cryptantha (*Cryptantha torreyana*), white layia (*Layia glandulosa*), white stemmed stick-leaf (*Mentzelia albicaulis*), longleaf phlox (*Phlox longifolia*), blepharipappus (*Blepharipappus scaber*), and annual phlox (*Microsteris gracilis*).

The Great Basin Mixed Scrub community occurs on north-northeast aspects of Peavine Mountain, near the Truckee River east of Verdi, near Dog Valley/Henness Pass Road north of Verdi, and at sporadic locations north of Mitchell Canyon and south of Long Valley. Portions of the variable-width corridor analysis areas of the Mitchell and Peavine Alternatives are within areas where the community occurs (**Figures 2A** through **2G**). The Great Basin Mixed Scrub community was also mapped at locations within the variable-width corridor of the Poeville

Alternative on the south side of Peavine Mountain (**Figure 2F**). It is likely that the vegetation community dominated the south side of Peavine Mountain prior to its conversion to invasive annual grasses following a wildfire in 2006.

Low Sagebrush Community

Low sagebrush is the dominant shrub of this eastside vegetation community. The community is generally restricted to basins with clay or saline-alkaline soils which are intermittently flooded, as well as to terraces, ridges and gentle slopes with hardpan or heavy clay substrates in moderate to higher altitudes (USFS 2008). Mormon tea, yellow rabbitbrush, granite prickly phlox (*Linanthus pungens*), and desert gooseberry may be present in the Low Sagebrush community (Nachlinger 1992). Some common herbaceous species include everlastings (*Antennaria* spp.), Pursh's milkvetch (*Astragalus purshii*), basin rayless daisy (*Erigeron aphanactis*), phlox (*Phlox* spp.), Sandberg bluegrass, threadleaf sedge, largehead clover (*Trifolium macrocephalum*), and Beckwith's violet (*Viola beckwithii*). The Low Sagebrush community is also associated with the follow special status species: Webber's ivesia, Dog Valley ivesia, Sierra Valley ivesia (*Ivesia aperta* var. *aperta*), and Lemmon's clover (*Trifolium lemmonii*).

Low sagebrush community occurs within the variable-width corridor and road widening corridor analysis areas of each action alternative, generally in relatively small patches (**Figures 2A** through **2G**). Most patches are within close proximity to Mitchell Canyon.

Mountain Sagebrush Community

Mountain sagebrush is a subspecies of big sagebrush and generally forms dominant stands at somewhat higher elevations than does basin big sagebrush or Wyoming sagebrush. On Peavine Mountain, the Mountain Sagebrush community occurs at elevations mainly within the range of 5,600 to 7,600 feet AMSL. Trees such as Jeffrey pine and quaking aspen are found within and in close proximity to the Mountain Sagebrush community. A variety of Great Basin and upper montane chaparral shrubs are also associated with the community, such as low sagebrush, bitterbrush, Wyoming sagebrush, curl-leaf mountain mahogany, rabbitbrush and snowbrush. The understory forbs and grasses present in the Mountain Sagebrush community are similar to those found in the Great Basin Mixed Scrub, Bitterbrush, and Bitterbrush-Big Sagebrush communities.

Mountain Sagebrush community occurs within the road widening corridor analysis areas of each action alternative. Within the variable-width corridor analysis areas, the community is almost unique to the Poeville Alternative with the exception of a small isolated area mapped in the analysis areas of the other alternatives south of the Bordertown Substation (**Figure 2A** through **Figure 2G**).

Ruderal Community

Ruderal vegetation community is the direct result of disturbance and represents early seral or colonizer species that are often non-native introduced species, invasive species, and/or noxious

weeds. Most of the species are annuals or short lived perennial herbs and graminoids. One of the dominant species within the Ruderal vegetation community is cheatgrass, an invasive species. Other invasive thistle species such as Scotch thistle (*Onorpodum acanthium*), musk thistle (*Carduus nutans*), and bull thistle (*Cirsium vulgare*) are also common along with Russian thistle (*Salsola tragus*), tumble mustard (*Sisymbrium altissimum*), and tessellate fiddleneck (*Amsinckia tessellata*) (Nachlinger 1992).

Ruderal community was mapped during field surveys within the variable-width corridors of the Mitchell and Peavine Alternatives at a single location along Dog Valley/Henness Pass Road in Verdi. Ruderal vegetation community was also mapped at various locations within the variable-width corridor analysis area of the Poeville Alternative and the Peavine/Poeville Alternative. The community also occurs within the road widening corridor analysis areas for each action alternative. All locations where Ruderal community occurs within and near the analysis areas are displayed on **Figure 2A** through **Figure 2G**.

Snowbrush Community

Snowbrush is a dominant shrub species on many eastside slopes of the Sierra Nevada. The species may form almost pure stands on slopes and in pockets where snow accumulates. The Snowbrush vegetation community may also establish in areas burned by wildfire or disturbed from logging (Nachlinger 1992). Snowbrush associates with conifers in the Eastside Pine and Jeffrey Pine vegetation communities. In drier environments, the Snowbrush community also grows adjacent to the Mountain Sagebrush, Bitterbrush, Upper Montane Mixed Chaparral, and Great Basin Mixed Scrub communities. On Peavine Mountain, snowbrush occurs at elevations above 5,600 feet AMSL. Snowbrush community occurs within the variable-width corridor analysis areas of all of the action alternatives and the road widening corridor analysis area of the Poeville and Peavine/Poeville Alternatives (**Figure 2A** through **2G**).

Wet Meadow Community

The Wet Meadow community occurs on aquic soils of level or gently sloping sites that have permanent sources of hydrology (USFS 2008). On Peavine Mountain, Wet Meadow community occurs in association with seeps and springs and riparian areas at all elevations. Dominant species are sedges (*Carex* spp.), rushes (*Juncus* spp.), and tolerant grass and forbs species associated with hydric soils.

For purposes of this analysis, Mesic Meadow community was incorporated into the Wet Meadow community due to the similarity between the two communities. The Mesic Meadow community is similar to the Wet Meadow community but occurs on seasonally saturated soils that typically dry during summer months. Dominant species within this vegetation community are Sandberg bluegrass, Baltic rush (*Juncus balticus*), meadow barley (*Hordeum brachyantherum*), Douglas sedge (*Carex douglasii*), and other graminoids associated with seasonally inundated soils.

Relatively small patches of Wet Meadow community occur within the variable-width corridor analysis area of each action alternative. The community also occurs within the road widening corridor analysis area of each action alternative with the exception of the Peavine/Poeville Alternative (**Figure 2A** through **Figure 2G**).

Willow Community

The Willow community occurs on both western and eastern slopes of the Sierra Nevada. It occurs in pure stands along streams and moist canyon bottoms, as well as a minor hardwood component of the understory in almost all conifer communities within those areas. Species of trees, such as willows, dominate the overstory, and may also be present within the understory or shrub layer. Willow species found within the vegetation community include Booth's willow (*Salix boothii*), narrowleaf willow (*Salix exigua*); Geyer willow (*Salix geyeriana*); Jepson's willow (*Salix jepsonii*); mountain willow (*Salix eastwoodiae*); arroyo willow (*Salix lasiolepis*); Lemmon's willow (*Salix lemmonii*); shining willow (*Salix lucida*); yellow willow (*Salix lutea*); and, Scouler's willow (*Salix scouleriana*). Hardwoods and shrubs such as quaking aspen, mountain alder, Fremont cottonwood, and black cottonwood may be associated with the Willow community in minor amounts (USFS 2008). Willow species may also be present in the understory as well as other shrub species such as rabbitbrush, Woods' rose, sagebrush, and American elderberry (*Sambucus nigra* ssp. *canadensis*) (Nachlinger 1992). Many mesic and hydric graminoids and forbs are associated with the Willow community.

The Willow vegetation community occurs throughout the general region of the proposed project in association with perennial creeks, springs, and seeps. It also occurs specifically within the variable-width corridor and road widening corridor analysis areas of each action alternative (**Figures 2A** through **2G**).

2.4.2 Vegetation Community Disturbances

The vegetation communities within the variable-width corridor and road widening corridor analysis areas have reached their current state of succession following a long history of anthropogenic disturbances spanning more than 200 years. Basque sheepherders were using the area for sheep grazing by the late 1800's and livestock grazing has continued on the NFS land until the mid-1990's (USFS 2009). Beginning in the 1950's, mining had a large impact on the area. Logging operations of the mining period frequently high-graded and removed only the best trees or denuded the landscape of all pines in other areas for lumber and firewood. Present-day disturbances are largely from OHV use, which is evident in the analysis areas for each action alternative. Illegal dumping can be detected in parts of the analysis areas.

Wildfire and wildfire suppression have also influenced the existing vegetation communities. The combination of wildfire in some areas and lack of wildfire (due to intensive suppression efforts since the 1920's) in other areas has resulted in a variety of succession stages within the area.

Areas protected from wildfire through fire-fighting efforts for the past approximately 100 years have accumulated heavy fuels loads and have been targeted on NFS land for fuels reduction (USFS 2009). In some instances, other areas in the analysis areas have burned multiple times in the past 10 to 15 years (e.g., Mitchell Canyon, Crystal, Peavine, and Verdi fires). Based on pedestrian surveys completed by JBR Environmental Consultants, Inc. and CALVEG data (USFS 2008), the areas burned from these more recent fires were seeded using perennial grass species, but cheatgrass, and in some cases medusahead, have become predominant. An exception is the area burned from the Crystal fire, which was planted with pine seedlings that have been mostly successful. Areas of the variable-width corridor and road widening corridor analysis areas burned from more recent wildfires are displayed on **Figure 3**.

Biological disturbances of vegetation communities have also occurred within the analysis areas. A 2008 USFS survey found Jeffrey pine beetle (*Dendroctonus jeffreyi*) and fir engraver beetle (*Scolytus ventralis*) tree mortality in the Dog Valley area. The pine engraver beetle and mountain pine beetle (*Dedroctonus ponderosae*) have also been detected in Dog Valley area (USFS 2009).

2.5 FOREST PRODUCT RESOURCES

Forest products can be managed for in forest communities that occur in the analysis areas (i.e., Eastside Pine, Jeffrey Pine, Mixed Conifer-Fir, Plantation, and Quaking Aspen vegetation communities). Areas where these vegetation communities occur on slopes of 35 percent or less are considered to be suitable for timber management. The acres of suitable timber management area within the variable-width corridor analysis area and the transmission line ROW/easement are presented in **Tables 2-5** and **2-6**, respectively.

Table 2-5 Suitable Timber Management Area within the Variable-Width Corridor

Alternative	Total Suitable Timber Management Area (Acres)	Percent of Analysis Area	Land Ownership/ Administration	Suitable Timber Management (Acres)*
Mitchell	223.3	31.9%	USFS	215.5
			Private	7.8
Peavine	105.7	15.4%	USFS	90.2
			Private	15.5
Poeville	14.4	1.5%	USFS	0.1
			Private	14.3
Peavine/Poeville	65.7	9.1%	USFS	52.1
			Private	13.6

*Suitable timber management area does not occur on BLM-administered public land. Acres listed are approximate.

Table 2-6 Suitable Timber Management Area within the ROW/Easement

Alternative	Total Suitable Timber Management (Acres)	Percent of Analysis Area	Land Ownership/ Administration	Suitable Timber Management (Acres)
Mitchell	37.3	27.0%	USFS	35.6
			Private	1.7
Peavine	18.8	16.1%	USFS	15.8
			Private	3.0
Poeville	2.2	1.0%	USFS	0.0
			Private	2.2
Peavine/Poeville	10.2	7.6%	USFS	8.0
			Private	2.2

Forest stands in the Dog Valley Management Area have been approved for thinning through the Dog Valley Fuels Reduction and Ecosystem Enhancement project (2010a). Tree thinning is needed in some stands due to the high degree of fuel loading and excessive stand densities in some areas. One approved thinning area (164 acres) occurs partially within the transmission line ROW/easement for the Mitchell Alternative. The forest communities within the thinning area located within the ROW/easement include Mixed Conifer-Fir and Eastside Pine. The thinning area currently has stand densities ranging from 365 to 539 trees per acre and is prescribed for thinning down to roughly 60 trees per acre. The planned thinning is designed to restore the stands to a state more representative of historic conditions, and would reduce fuel loading to a level more consistent with pre-settlement fire regimes (USFS 2009). Approximately 31 acres of this planned thinning project intersect the variable-width corridor analysis area for the Mitchell Alternative.

Also included in the Dog Valley Fuels Reduction and Ecosystem Enhancement Project is an 838-acre area that has been slated for shrub and incidental small tree thinning. The area is intersected by the Mitchell and Peavine Alternatives. Prescribed burning is slated to reduced fuels in 193 acres of the analysis areas for the proposed Mitchell and Peavine Alternatives. Lastly, a planned 33-acre mastication treatment also intersects 15.8 acres of the analysis area for the Mitchell Alternative (**Table 2-7**).

Recent completed projects that have altered the forest or forest products within the area of the proposed alternatives include:

- Crystal fire salvage sale in the latter half of the 1990s;
- Mitchell Canyon personal use firewood sale signed in 2004;
- Beagle personal use firewood area completed in 2013;

- Prescribed burn projects completed between 2010 and 2012; and
- Mastication projects completed between 2010 and 2012.

The Crystal fire salvage sale occurred in the late 1990s in areas intersected by the Mitchell and Peavine Alternatives. The Mitchell Canyon personal use firewood sale thinned an approximately 69-acre stand of overly dense Jeffrey pine and white fir located just east of the analysis area of the Mitchell, Peavine, and Peavine/Poeville Alternatives (USFS 2004a). The project was approved in 2004 and was approximately 80 percent complete in 2013. The Beagle personal use firewood area was open to live-tree cutting from July 15, 2013, to November 15, 2013. Since 2010, the USFS Carson Ranger District fuels program has been implementing the approved prescribed burns and mastication projects from the Dog Valley Ecosystem Enhancement Project. Approximately 381 acres of prescribed burns and approximately 774 acres of mastication have been completed (**Table 2-7**). A 24-acre prescribed burn was recently completed immediately adjacent to the analysis area of the Mitchell Alternative.

Table 2-7 Planned and Completed Forest Treatments on NFS Land

Forest Treatment Type	Total Forest Treatments (Acres)	Portion Within Analysis Area (Acres)[1]	
		Mitchell Alternative	Peavine Alternative
Planned Treatments			
Tree thinning	4,323	32.0	NA[2]
Shrub and small tree thinning	838	179.0	58.9
Prescribed burning only	2,900	283.0	60
Green Personal Use Fuelwood areas	20 (annually)	0.0	0.0
Completed Treatments			
Crystal Fire Salvage Sale (completed latter half of the 1990s)	3,089	105.0	59.0
Mitchell Canyon Personal Use Firewood Sale (signed in 2004)	69	NA	NA
Beagle Personal Use Firewood Area (to be completed in 2014)	75	9.3	NA
Prescribed burning (completed between 2010 and 2012)	381	NA	NA
Mastication (completed between 2010 and 2012)	774	16.0	NA

[1]Completed or planned forest treatments do not occur in the analysis area for the Poeville and Peavine/Poeville Alternatives.
[2]NA: Not applicable

Other Forest Product Resources

In addition to commercial sawtimber, the USFS issues permits for personal and commercial use firewood and Christmas tree cutting on NFS land. Individual firewood permits are sold by the USFS Carson Ranger District for 15 dollars per cord, with a 2-cord minimum and 6-cord maximum. The permit stipulates that firewood cut under individual permits may not be sold. Individual firewood permits are currently authorized for live-tree cutting, and are not currently authorized for dead-tree cutting in the Dog Valley Management Area. It is probable that the area will be opened up again in the near future to dead-tree firewood cutting if and when additional mortality occurs (Brinnand, A., personal communication). Green firewood cutting usually entails cutting of designated trees only and slash must be piled. Larger-scale fuel wood projects have included the Mitchell Canyon Personal Use Firewood Project. This project was undertaken to thin a 69-acre stand of overly dense, closely spaced small trees (USFS 2004a), and the project should be completed in 2014. The Mitchell, Peavine, and Peavine/Poeville Alternatives are located just west of the thinned stand. Commercial firewood permits allow for sale of firewood. Given the availability of pine and mixed conifers in the Dog Valley area, those species are predominantly chosen for firewood. Christmas tree permits are 10 dollars each and cutting areas include portions of Dog Valley, mainly along existing MVUM designated roads.

2.6 NOXIOUS WEEDS AND INVASIVE SPECIES

All habitats are vulnerable to noxious weed infestations. Weeds may spread more rapidly in disturbed areas but also invade undisturbed habitats. Noxious and invasive weeds spread aggressively through wind, water, wild animals, birds, livestock, vehicles, and people. Vehicles used in weed infested areas can spread weeds by transporting seeds or vegetation inadvertently carried on the vehicle. Infestations can begin miles away from the source as seeds drop off. Vehicle use can also create areas of barren ground, providing favorable habitat for weed species, which often colonize barren areas. Any foreign materials such as seed, erosion control materials, fill soil, topsoil, and soil amendments or mulch can also be vectors for noxious and invasive weeds. Because a large amount of the lands surrounding the Reno area have burned over the past two decades and have constant effects from vehicle use or other human impacts, noxious weed and invasive species infestations are common.

Noxious weed infestations identified within the 4-mile corridor analysis area of each action alternative are presented in **Table 2-8**. The table presents the acreage of mapped infestations and number of point occurrences for which acreage in unknown. **Figures 4**, **5**, **6**, and **7** display the locations of noxious weed infestations that have been mapped within the 4-mile corridor analysis area of the Mitchell, Peavine, Poeville, and Peavine/Poeville Alternatives, respectively. **Table 2-9** presents the acreage and point occurrences of noxious weed infestations specifically within the variable-width corridor and road widening corridor analysis areas of each action alternative.

Most noxious weed infestations that are located within the variable-width corridor and road widening corridor analysis areas occur as small, isolated patches that are less than 1 acre in size.

Table 2-8 Noxious Weeds within 4-Mile Corridor Analysis Area

Common Name (*Scientific Name*)	**Mitchell**		**Peavine**		**Poeville**		**Peavine/Poeville**	
	Acres	**No.**	**Acres**	**No.**	**Acres**	**No.**	**Acres**	**No.**
Russian knapweed (*Acroptilon repens*)	304	0	304	0	541	0	325	0
Barbed goatgrass (*Aegilops triuncialis*)	0	0	0	0	0	1	0	0
Pacific reedgrass (*Calamagrostis nutkaensis*)	1	0	1	0	3	0	3	0
Hoary cress/Whitetop (*Cardaria draba*)	151	2	151	2	187	5	183	5
Musk thistle (*Carduus nutans*)	584	113	579	103	1381	90	726	94
Canada thistle (*Cirsium arvense*)	2	9	2	8	6	8	5	8
Bull thistle (*Cirsium vulgare*)	29	28	19	22	28	24	19	20
Diffuse knapweed (*Centaurea diffusa*)	276	13	276	13	502	13	276	13
Spotted knapweed (*Centaurea maculosa*)	562	4	562	3	1046	3	700	3
Yellow star-thistle (*Centaurea solstitialis*)	615	3	614	3	1256	6	835	6
Poison hemlock (*Conium maculatum*)	20	1	20	1	33	2	22	2
Field bindweed (*Convolvulus arvensis*)	0	1	0	1	0	1	0	1
Medusahead (*Taeniatherum caput-medusae*)	280	42	302	43	740	53	726	54
Dyer's woad (*Isatis tinctoria*)	0	2	0	2	0	2	0	2
Tall whitetop (*Lepidium latifolium*)	605	12	605	13	1262	19	819	17
Scotch thistle (*Onopordum acanthium*)	511	25	511	25	1003	23	769	21
Russian thistle (*Salsola tragus*)	0	1	0	1	0	2	0	1
Tamarisk (*Tamarix* sp.)	334	0	334	0	871	0	447	0
Puncture vine (*Tribulus terrestris*)	255	0	255	0	444	0	444	0
TOTAL:	**4529**	**256**	**4535**	**240**	**9303**	**252**	**6299**	**247**

Source: Nevada Natural Heritage Program (2011); The Calflora Database (2012); Truckee Meadows Weed Coordinating Group (2007a; 2007b; 2007c); and, data from pedestrian surveys completed between 2012 and 2013.

Table 2-9 Noxious Weeds within Variable-Width and Road Widening Corridors

Common Name (*Scientific Name*)	Mitchell		Peavine		Poeville		Peavine/Poeville	
	Acres	No.	Acres	No.	Acres	No.	Acres	No.
Russian knapweed (*Acroptilon repens*)	0	0	0	0	1.5	0	0	0
Barbed goatgrass (*Aegilops triuncialis*)	0	0	0	0	0	1	0	0
Hoary cress/Whitetop (*Cardaria draba*)	0	0	0	0	0	1	0	1
Musk thistle (*Carduus nutans*)	1.4	7	0.6	2	9.3	47	2.1	40
Diffuse knapweed (*Centaurea diffusa*)	0	6	0	6	1.5	6	0	6
Spotted knapweed (*Centaurea maculosa*)	0.1	0	0.1	0	1.5	0	0	0
Yellow star-thistle (*Centaurea solstitialis*)	0	0	0	0	1.8	1	0.3	1
Canada thistle (*Cirsium arvense*)	0	0	0.0	0	0	0	0.0	0
Bull thistle (*Cirsium vulgare*)	1.6	9	0.6	7	0.5	11	0.1	11
Poison hemlock (*Conium maculatum*)	0	0	0	0	0	1	0	1
Field bindweed (*Convolvulus arvensis*)	0	0	0	0	0	1	0	1
Medusahead (*Taeniatherum caput-medusae*)	3.1	6	11.3	6	3.7	20	17.0	28
Tall whitetop (*Lepidium latifolium*)	0	1	0	1	1.9	11	0.4	9
Scotch thistle (*Onopordum acanthium*)	0.2	1	0.1	1	10.4	13	9.7	11
Russian thistle (*Salsola tragus*)	0	0	0	0	0	2	0	0
Tamarisk (*Tamarix* sp.)	0	0	0	0	1.8	0	0.3	0
Puncture vine (*Tribulus terrestris*)	0	0	0	0	0.4	0	0.4	0
Total:	**6.4**	**30**	**12.7**	**23**	**34.3**	**115**	**30.3**	**109**

Source: Nevada Natural Heritage Program (2004; 2011); The Calflora Database (2012); Truckee Meadows Weed Coordinating Group (2007a; 2007b; 2007c); and, data from pedestrian surveys completed between 2012 and 2013.

Of the noxious weed species identified within the analysis areas, several are of primary concern due to the degree of impact they have on ecosystem function and the density or size of the existing infestations. These species are described in more detail below. The California and Nevada noxious weed rating of each species is provided in **Table 2-10**, which follows the species descriptions below. The noxious weed ratings can be used to prioritize and target weed treatments to the most damaging species. **Table 2-10** also provides more details for all identified noxious weed species, including those not considered to be of primary concern.

Musk thistle (*Carduus nutans*)

Musk thistle, or sometimes referred to as nodding plumeless thistle, is an annual to biennial invasive thistle that is native to southern Europe and western Asia. It was introduced to the United States in the early 1900's and has invaded much of the country as well as Canada since that time. It is quite tall, towering over 6 feet in height at times and spreads rapidly through seed dispersion, forming dense stands (Whitson 1999). The seeds appear to posses allelopathic qualities that prevent other plant seeds from growing, and the bolting plant seems to also release allelopathic compounds into the soil as the plant leaves start to decompose. Musk thistle can also inhibit nitrogen fixation by white clover and has the potential to reduce nitrogen levels in soils. Seeds are easily dispersed and have mucilaginous coatings that improve transport and germination on heavier soils. Viable seeds can persist for up to 7 years (CDFA 2013b). Seeds generally fall near the plant, or are dispersed by wind, water, birds, and small mammals (Cal-IPC 2003).

Musk thistle is abundant throughout the analysis areas and surrounding locality (**Figure 4** through **Figure 7**). More than 500 acres of infestations have been mapped within the 4-mile corridor analysis area of each action alternative (**Table 2-8**). A notably large musk thistle infestation occurs south of the Poeville Alternative (**Figure 6**). This area was burned in a wildfire during 2006 (**Figure 3**).

Spotted knapweed (*Centaurea maculosa*)

Spotted knapweed is a biennial or short-lived perennial knapweed that is becoming widespread throughout the western United States. Spotted knapweed has an elongated taproot and may more successfully extract soil nitrogen resources, thus preventing soil nutrients from being available to native species. Perhaps it is through this mechanism, that it successfully invades undisturbed native shrub and bunchgrass plant communities, and eventually displaces native vegetation. On sites infested with spotted knapweed, runoff and sedimentation increases compared to the native plant communities. It is rated as having a high degree of impact on ecological function. It is spread through seed by animals and birds as well as through vehicles/machinery and in hay.

This species continues to spread in some areas, however many control programs have been aimed at decreasing the spread of this species. In some areas it is decreasing due to the success of the control measures (Cal-IPC 2013). Spotted knapweed has been mapped within the 4-mile corridor analysis area of each action alternative (**Table 2-8**). As displayed on **Figure 4** through **Figure 7**, it also occurs within the variable-width corridor analysis area of each action alternative, with the exception of the Peavine/Poeville Alternative (**Table 2-9**).

Yellow star-thistle (*Centaurea solstitialis*)

Yellow star-thistle is a deep-rooted annual that flowers in midsummer. It displaces native species and greatly alters the habitat for wildlife, reducing plant and animal diversity. It germinates

rapidly in the early spring and captures water and nutrient resources before native species have broke dormancy. It spreads short distances by wind, but dispersal distances are farther from animals and vehicles (DiTomaso et al. 2006).

Yellow star-thistle will continue to spread, but is most abundant at lower elevations. It frequently infests drier habitats with soil disturbances, such as along roads and trails. In many areas, it is spread through road grading and other road maintenance activities and on vehicles it comes in contact with. This species spreads aggressively and has a high ecological impact on native plant communities. Mapping estimates indicate that there are more than 600 acres of yellow star-thistle infestations within the 4-mile corridor analysis areas of each action alternative (**Table 2-8**) (NNHP 2004). As **Table 2-9** shows, infestations are much less abundant within the variable-width and road widening corridor analysis areas. **Figure 4** through **Figure 7** shows the yellow star-thistle infestations that have been mapped within proximity to each of the action alternatives.

Bull thistle (*Cirsium vulgare*)

Bull thistle is found in pastures, along roadsides, and at disturbed sites (Whitson 1999). Disturbance, heavy grazing, and fertilization are conditions that favor bull thistle (Sheley 1994). Water, animals, and human activities are responsible for most seed dispersal. Bull thistle will continue to spread throughout the analysis area. The places most likely to be infested include those where bare ground is formed, native vegetation is reduced, and a seed source is nearby. These conditions would include the conditions following wildfires. Native plant communities that are dominated by vigorous, healthy plants can eventually crowd bull thistle.

As indicated in **Table 2-8**, the acres of bull thistle infestations mapped within the 4-mile corridor analysis area ranges from approximately 19 acres to 29 acres, depending on the specific action alternative. Bull thistle is also mapped within the variable-width corridor area of each action alternative (**Figures 4** through **7**).

Medusahead (*Taeniatherum caput-medusae*)

Medusahead is a non-native noxious annual grass that has invaded northern California and western Nevada in the last 40 to 60 years. It is known to change ecosystem functions, similar to cheatgrass. It increases litter density, outcompetes native species for shallow soil moisture and increases fire frequency. Once established, the thick mat of high-silica litter prevents other seeds from contacting the soil, preventing reproduction of native species (Cal-IPC 2003). Medusahead is also considered a transformer species and is considered a top priority for early detection and eradication (D'Antonio et al. 2004). Medusahead spreads quickly into disturbed areas through seed dispersal. The long awns on the seeds readily attach to passing animals, machinery or vehicles, and clothing and are transported to distant areas. The plant is less palatable to grazing animals than cheatgrass due to the length of the sharp awns and the high silica content (Pollack and Kan 2000).

As medusahead is detrimental to the rare plants Webber's ivesia and Dog Valley ivesia, an inventory of medusahead locations along each of the action alternatives has been completed. Medusahead is distributed throughout many areas within the 4-mile corridor analysis area of each action alternative and surrounding proximity (**Figure 4** through **Figure 7**). Estimated acreages of infestations within the analysis area of each alternative are presented in **Table 2-8**. Approximate acreages within the combined area of the variable-width corridor and road widening corridor analysis areas are provided in **Table 2-9**.

Tall Whitetop (*Lepidium latifolium*)

Tall whitetop, also commonly referred to as perennial pepperweed, has invaded many riparian corridors throughout Nevada and California. It is a perennial species with a deep taproot that allows it to capture water resources that many native species are unable to access. The species has the ability to pull salt from deep soil horizons and deposit it on the soil surface. This soil salinity alteration favors halophytes and prevents native species from readily establishing in previous habitats following treatment. This species invades areas of natural (fluvial and fire) and anthropogenic disturbance, and once established, spreads rapidly through clonal roots and rarely by seed. It occurs most commonly in riparian corridors and around ditches, seeps, and springs, but can invade drier sites on rangelands and roadsides as well (Cal-IPC 2003).

Estimates indicated that tall whitetop infestations are abundant within the variable within the 4-mile corridor analysis area of each alternative (**Table 2-8**). It is found within areas burned from the 2006 Verdi wildfire, along the Truckee River, along U.S. Highway 395, and around low-elevation seeps and springs (**Figures 4** through **7**).

Scotch thistle (*Onopordum acanthium*)

Scotch thistle is a biennial that is frequently found in areas disturbed by grazing or wildfire (Cal-IPC 2003, Sheley 1994). It thrives in higher moisture areas or areas with higher soil fertility, but it can invade lower moisture sites as well. It is very competitive and can suppress desirable forage species and annual grasses. It usually greatly alters the plant community composition, structure and interactions, and moderately alters ecosystem processes (Cal-IPC 2003).

Scotch thistle occurs within the 4-mile corridor analysis area of each action alternative (**Table 2-8**) and is likely to continue its spread within and surrounding the analysis area. Wildfires have been frequent in the analysis area and locality, and Scotch thistle will likely continue to establish readily into newly burned areas. Notably large infestations occur east of Verdi and infestations are common throughout the Verdi area (**Figures 4** through **7**).

Tamarisk (*Tamarix* sp.)

Tamarisk, also commonly referred to as salt cedar, occurs in many areas along riparian corridors in the western United States. Tamarisk has an enormous impact on the function of riparian systems. The species is a salt-loving and has a deep taproot that impacts riparian area soils and

hydrology by reducing streamflows and increasing salt content of the surface soils. Tamarisk effectively displaces native willows and other riparian species and condition the soil as to make it difficult to rehabilitate the area following control. Tamarisk reproduces by seeds that are generally wind or water dispersed.

Estimates indicate that tamarisk is relatively abundant within the 4-mile corridor analysis area of each action alternative (**Table 2-8**). Mapping shows that most infestations occur near relatively permanent water sources, such as the Truckee River (**Figures 4** through **7**).

Table 2-10 Noxious Weeds: Species Information

Common Name (Scientific Name)	Noxious Weed Rating		Ecological Impact[3]	Abundance[4]	Trend[4]	Rate of Spread[5]	Typical Dispersal Method
	California[1]	Nevada[2]					
Russian knapweed (*Acroptilon repens*)	Noxious B	Noxious B	Moderate	Low	Decreasing	8-11%	Seed, root buds
Barbed goatgrass (*Aegilops triuncialis*)	Noxious B	Invasive	High	Low	Spreading	Rapid	Seed
Hoary cress/Whitetop (*Cardaria draba*)	Noxious B	Noxious C	Limited	Low	Spreading	Up to 12 ft per year from one plant	Seed, root fragments
Musk thistle (*Carduus nutans*)	Noxious A	Noxious B	Moderate	Moderate	Managed-Spreading	Slowly expanding	Seed
Diffuse knapweed (*Centaurea diffusa*)	Noxious A	Noxious B	Moderate	None to Moderate	Managed-Spreading	Very rapid	Seed, vegetation fragments
Spotted knapweed (*Centaurea maculosa*)	Noxious A	Noxious A	High	None to Moderate	Managed	Rapid	Seed
Yellow star-thistle (*Centaurea solstitialis*)	Noxious C	Noxious A	High	None to Low	Managed-Spreading	Exponential	Seed
Canada thistle (*Cirsium arvense*)	Noxious B	Noxious C	Moderate	None to Low	Managed	Several meters per year	Seed, root fragments
Bull thistle (*Cirsium vulgare*)	Noxious C	Invasive	Moderate	Low	Spreading	Little spread except disturbed areas	Seed
Poison hemlock (*Conium maculatum*)	Invasive	Noxious C	Moderate	Low	NA	Rapid spread in disturbed areas	Seed
Field bindweed (*Convolvulus arvensis*)	Noxious C	Invasive	NA	NA	NA	NA	Seed, root nodes
Medusahead (*Taeniatherum caput-medusae*)	Noxious C	Noxious B	High	Low	Spreading	<10 yrs	Seed
Dyer's woad (*Isatis tinctoria*)	Noxious B	Noxious A	Moderate	None to Low	Managed-Eradicated	14% per year	Seed
Tall whitetop (*Lepidium latifolium*)	Noxious B	Noxious C	High	None to Moderate	Managed-Spreading	<10 yrs	Seed, spreading roots, vegetation or root fragments
Scotch thistle (*Onopordum acanthium*)	Noxious A	Noxious B	High	None - Low	Managed-Spreading	<10 yrs	Seed
Russian thistle (*Salsola tragus*)	Noxious C	Invasive	Limited	Low	No trend	Stable	Seed

Common Name (Scientific Name)	Noxious Weed Rating		Ecological Impact[3]	Abundance[4]	Trend[4]	Rate of Spread[5]	Typical Dispersal Method
	California[1]	Nevada[2]					
Tamarisk (*Tamarix* sp.)	Noxious B	Noxious C	High	Low	NA	6 yrs, more recently 3-4% per year	Seed, vegetation and root fragments
Puncture vine (*Tribulus terrestris*)	Noxious C	Noxious C	NA	NA	NA	Rapid spread in disturbed areas	Seed

[1] CDFA (2013a)
[2] NAC 555.010 and USFS (2001)
[3] Cal-IPC (2011)
[4] Cal-IPC (2013)
[5] Cal-IPC (2003) (Plant Assessment Forms). Rates of spread when available are given in how long it takes for the population to double in size. Rates of spread are without control measures.

2.6.1 Invasive Species

A total of 4 invasive species have been identified within the 4-mile corridor analysis area of the action alternatives. **Table 2-11** presents the acreage and number of point occurrences of each species within the variable-width and road widening corridors analysis area of each action alternative. As the table shows, most invasive species are relatively rare within the analysis areas. The exception is cheatgrass, which is mapped extensively throughout the analysis areas (**Figure 8**). A detailed description of cheatgrass follows **Table 2-11**.

Table 2-11 Invasive Species within Variable-Width and Road Widening Corridors

Common Name (*Scientific Name*)	**Mitchell Alternative**		**Peavine Alternative**		**Poeville Alternative**		**Peavine/Poeville Alternative**	
	Acres	**No.**	**Acres**	**No.**	**Acres**	**No.**	**Acres**	**No.**
Cheatgrass (*Bromus tectorum*)	473	0	389	0	676	0	400	0
Fuller's teasel (*Dipsacus fullonum*)	0	0	0	0	0	2	0	2
Himalayan blackberry (*Rubus armeniacus*)	0	0	0	0	0	1	0	1
Bouncingbet (*Saponaria officinalis*)	0	0	0	0	0	3	0	1
TOTAL:	**473**	**0**	**389**	**0**	**676**	**6**	**400**	**4**

Source: Source: Nevada Natural Heritage Program (2004; 2011); The Calflora Database (2012); Truckee Meadows Weed Coordinating Group (2007a; 2007b; 2007c); and, data from pedestrian surveys completed between 2012 and 2013.

Cheatgrass (*Bromus tectorum*)

Cheatgrass is an invasive species that is likely to increase on NFS land, BLM-administered public land, and private land. It is widespread throughout the western United States and frequently occurs in areas burned by wildland fires and disturbed areas. Cheatgrass is also dispersed into undisturbed and intact native plant communities. Once a disturbance such as fire occurs, cheatgrass has high potential to cause a vegetation type to convert to annual grasslands. Once established, cheatgrass alters litter distribution forming a mat that effectively prevents establishment of many native perennial species. Cheatgrass also becomes dominant through competitive exclusion of native species seedlings (Melgoza and Nowak 1991; Rafferty and Young 2002). Once established, cheatgrass is more susceptible to wildland fire than native vegetation and may increase fire return interval to as frequent as every 5 years or less. Numerous wildland fires have occurred in the 4-mile corridor analysis area since 1984, with the 1984 fire affecting areas along all of the action alternatives (**Figure 3**).

Cheatgrass is capable of invading almost all vegetation communities within the analysis areas, except the riparian communities (i.e., Willow, Wet Meadow, and Quaking Aspen communities), as it is found in areas that receive 6 to 22 inches of annual precipitation and can withstand

almost any soil type (Young 2000). Low elevation ponderosa pine forests are considered more resistant to cheatgrass invasion than shrubland and grass ecosystems, however, following disturbance cheatgrass is capable of invading lower elevation pine forests of the Sierra Nevada (D'Antonio et al. 2004; Keely et al. 2003; Keeley and McGinnis 2007). Cheatgrass is spread by wind, transport in feces of wild and domesticated animals, and attachment to fur or by small rodents. Seed can also be spread in mud clinging to machinery and vehicles (Cal-IPC 2003).

Comprehensive surveys of cheatgrass have not been completed for the 4-mile corridor analysis area, but in 2003, the Nevada Natural Heritage Program created an estimate of percent cover of cheatgrass using Landsat 7 ETM+ satellite data. **Figure 8** shows the percent cover classes of cheatgrass that were estimated for the analysis area. Since this dataset was created, additional fires have occurred in 2003, 2004, 2006, and 2007 within, or in close proximity to, the analysis area (**Figure 3**). Areas where these fires occurred are now dominated by ruderal plants or annual grasses, including cheatgrass (**Figures 2A** through **2G**).

3.0 EFFECTS ANALYSIS

This section of the Specialist Report analyzes and discloses the potential effects that the proposed project would have on vegetation resources and noxious and invasive weed species. In accordance with 40 CFR 1508.8, effects and impacts are used synonymously, and include both direct and indirect effects. The potential cumulative impacts of the proposed project are also discussed in this section of the Specialist Report.

3.1 ANALYSIS METHODOLOGY

The potential direct and indirect effects that each alternative were anticipated to have on vegetation resources were analyzed and quantified using the impact indicators listed below.

- **Acres and degree of surface disturbance for each vegetation type.** The degree of disturbance may affect ground cover, plant community composition and structure, and reproductive capability including recruitment of perennial plants.
- **Area of forested community types where timber cutting may be needed to maintain safe line clearance between conductor wires and trees.** Removal of trees may contribute to vegetation type conversions, vegetation succession changes, and increased water yield, and may alter disease and pest transmission to remaining trees.
- **Abundance of known noxious weed infestations.** Disturbances located near existing noxious weed infestations are more likely to cause the infestation to spread and increase future control costs. An abundance of existing infestations would also be more likely to require a larger quantity of herbicides for pre- and post-construction treatment.
- **Miles of new centerline travel roads required for project access.** Unauthorized OHV use on centerline travel roads may contribute to the spread of noxious weeds in vegetation communities currently inaccessible to OHVs, and may compromise the success of seeding on reclaimed roads, impacting natural vegetation succession.

3.1.2 Methods of Analysis

Table 3-1 defines the terms used to describe magnitude and duration of effects on vegetation resources.

Table 3-1 Description of Vegetative Cover Types Impacts Levels

Attribute of Effects		Description Relative to Vegetation Resources
Magnitude	Negligible	A change in current vegetative conditions that is too small to be physically measured using normal methods or perceptible to a trained human observer. There is no noticeable effect on the natural or baseline setting. There are no required changes in management or utilization of the resource.
	Minor	A change in current vegetative conditions that is just measurable with normal methods or barely perceptible to a trained human observer. The change does not result in a modification in the overall population, or the value or productivity of the vegetation community. There are no required changes in management or utilization of the resource.

Attribute of Effects		Description Relative to Vegetation Resources
	Moderate	An easily measurable change in current vegetative conditions that is readily noticeable to a trained human observer. The change may lead to modification or loss in persistence in the overall vegetation community, or the value or productivity of the vegetation cover. There are some required changes in management or utilization of the resource.
	Major	A large, measurable change in current vegetative conditions that is easily recognized by all human observers. The change may lead to substantial modification in the overall vegetation community, or the value or productivity of the vegetation cover. There are profound or complete changes in management or utilization of the resource.
Duration	Short-term	Vegetative integrity restored within 20 years.
	Long-term	Vegetative integrity remains impacted after 20 years.

The exact location of pole sites, wire stringing sties, staging areas, log landings, skid trails, and new access roads is not known until an alternative has been selected through the NEPA process and final design is engineered. However, NV Energy intends to limit all construction disturbance at pole sites, wire stringing sites, and staging areas, skid trails and landings, and all new access roads to the 300- to 600-foot variable-width corridor analysis area of the selected alternative. In order to ensure that all possible impacts on vegetation resources were analyzed, it was assumed that the entire variable-width corridor analysis area of the selected alternative would potentially be disturbed. In reality, the impacts would likely be far less than what those derived from this analysis because construction activities at pole sites, wire stringing sties, staging areas, skid trails and landings, and new access roads would disturb only a portion of the variable-width corridor analysis area. Likewise, the specific existing roads that would be used for project access and required widening are also unknown prior to the selection of an alternative. Accordingly, to ensure all potential vegetation impacts from widening disturbance were analyzed, it was assumed that all existing roads that may be potentially used for access for an alternative would be widened to 30 feet. In reality, widening disturbance would be expected to be less than that derived in this analysis because not every road analyzed would be widened to 30 feet.

3.2 DIRECT AND INDIRECT EFFECTS

3.2.1 No Action Alternative

Construction of the proposed project and subsequent operation and maintenance of the proposed transmission line would not occur under implementation of the No Action Alternative. The No Action Alternative would not cause any increase in ground disturbance from the existing conditions within the analysis area. Vegetation communities within the analysis area would continue to be influenced by other approved fuels reduction and ecosystem enhancement projects, vegetation succession, and other natural occurrences, such as wildland fire, drought or storm damage. Fuel loads would continue to build in some of the area over time and the No Action Alternative would have a greater continuity of fuel on the NFS land within the variable-

width corridor analysis area of the action alternatives. Noxious and invasive weeds would not be monitored annually with the implementation of this alternative and may continue to spread unabated from private land to NFS land. Forest product resources would remain in place throughout the analysis area.

3.2.2 Effects Common to all Action Alternatives

3.2.2.1 Construction

Direct and Indirect Effects to Vegetation Communities.

Under all action alternatives, impacts to sensitive vegetation community types would be minimized as much as possible. Impacts on sensitive riparian vegetation communities would be minimized design feature WA 4, which prohibits staging areas within 150 feet of seasonally flowing streams and 300 feet of perennial streams. Impacts would also be minimized by design feature WA 5, which prohibits pole sites from being located within 100-year floodplain and wetlands and requires stream crossings to be minimized.

There would be long-term loss of ground cover resulting from construction of any of the action alternatives. The loss may be considered permanent in some areas because it may continue to occur beyond the operational life of the project. The proposed expansion area of the Bordertown Substation facility, which is located entirely on BLM-administered public land, would cause the long-term (permanent) loss of approximately 3.7 acres of Bitterbrush-Sagebrush vegetation community. Installation of poles would permanently displace vegetation within an area measuring 23 inches in diameter (0.0003 acre) for each pole. On average, pole structures would be placed every 800 feet and the number of pole structures would be proportional to the length of the alternative. The type and amount of vegetation community that would be impacted cannot be determined at this time because the exact locations of where pole structures would be placed are not known. Therefore, the acres of each type of vegetation community within the ROW/easement area are presented to provide an indication of the type and relative abundance of vegetation communities that could be permanently displaced by pole structures.

The majority of project impacts for all action alternatives consist of the short-term loss of ground cover, which would have short-term, long-term, and possibly permanent impacts to vegetation communities. The loss of ground cover would be short term in all areas that are restored (reclaimed and reseeded) following construction. Construction activities/areas that would be restored are listed in **Table 1-1** and include pole sites, wire setup sites, staging areas, line clearance areas, skid disturbances and log landings, new access roads, and areas where existing roads are widened for construction. The locations of line clearance areas and road widening areas are known and allow the acreage of impacts by vegetation community to be assessed. The locations for all other construction activity/areas are not known, however, it is certain that these

project elements would be constructed somewhere within the ROW or the variable width corridor. Therefore, the acres of vegetation community that are present within the ROW and the variable-width corridor would represent the best estimation of vegetation impacts for pole sites, wire setup sites, staging areas, skid disturbances and log landings, centerline travel road and spur roads.

To restore ground cover, restoration seed mixes and seeding rates would be tailored to the desired vegetation community, soil substrate, elevation, and land administration/ownership. It would likely take approximately 3 to 5 years to meet restoration success criteria under optimum conditions, depending on the localized environmental conditions at restoration site and the type, intensity, and duration of the disturbance. Xeric sites, particularly south facing slopes, steep slopes, and sites with little soil tend be the least ecologically resilient. Ground cover restoration from the appropriate vegetation communities that occur in less ecologically resilient sites may require more than 5 years or potentially may never be fully restored.

The environmental interactions are too complex and disturbance regimes too variable for a detailed analysis of effects specific to each vegetation community within the analysis areas. However, general effects common to all vegetation communities and general effects to forest communities and grass and shrub-dominated communities can be described and are presented below.

General Effects to All Vegetation Communities

1. **Temporary loss of effective ground cover.** Removing vegetation biomass would result in a loss of effective ground cover (vegetation, litter, biotic soil crusts). Reduction of ground cover would make soils more susceptible to splash erosion and reduce soil nutrient cycling. Also, without effective ground cover, nutrient cycling into the soil surface is reduced. Therefore, loss of effective ground cover from vegetation removal or disturbance would have an adverse impact to soils and, ultimately, recovering vegetation communities.

   The primary methods of minimizing the effects from the loss of ground cover is through implementation of best management practices (BMPs), implementation of design features (see **Section 1.2.4**), and restoration of disturbed areas. A Storm Water Pollution Prevention Plan (SWPPP) would be developed once an action alternative is selected, which would identify specific BMPs that would be implemented throughout construction. To ensure the efficacy of erosion and siltation controls identified in the SWPPP, inspections would be made at least once per week and before and after rain events. Additional methods would be used during construction to minimize the potential for erosion. Woody branches would be chipped and spread over the surface of the access road and adjacent areas to serve as erosion controlling mulch and reduce fuel loading.

Design feature VG 6 specifies that chips would be incorporated into the soil, as needed and where allowed. To minimize spread of pine engraver beetles, material from live pine species would not be spread from August 1st to December 31st per design feature FH 1. To encourage rapid regrowth of vegetation and minimize soil erosion, design feature VG 5 specifies that shrub vegetation would be cleared primarily by mowing or masticating vegetation in a manner that leaves root systems intact.

2. **Changes in vegetation community composition and structure.** Clearing or disturbing vegetation would change the composition and structure of a vegetation community by shifting it into an earlier (i.e., primary or beginning) successional stage. Immediately following vegetation removal, new plants would be highly competitive pioneering plants. With the exception of forest communities, most vegetation communities are expected to continue to progress to more developed successional stages. Specific effects to forested communities are described in further detail below.

   For all vegetation communities, to ensure the restored community would attain the appropriate community composition over time, the success criteria that would be used for reclaimed vegetation would be based on reference sites. On NFS land, design feature VG 7 requires that reference sites be representative of the ecological site as described by NFS Matrices and in a late-seral and ecologically functioning condition. To protect late succession stage stands of trees in forest vegetation communities, design features VG 1 and VG 2 would ensure that larger diameter trees be avoided whenever possible.

3. **Introduction and/or perpetuation of noxious weeds and invasive plants.** Construction activities would potentially result in the introduction of noxious and invasive weeds. Surface disturbance from construction activities would temporarily remove native vegetation communities at the pole structure sites, wire setup sites and staging areas, and along new temporary access roads and existing roads that are widened for access. The removal of native vegetation communities and disturbance of soils would create conditions that facilitate weed infestations. The introduction of noxious and invasive weeds would be related to the use of project vehicles, construction equipment, earth materials (e.g., fill dirt, topsoil, etc.), or erosion control installations (e.g., straw bales, wattles, etc.) contaminated with noxious weed seeds. The presence of existing noxious weed infestations within the analysis area would increase the likelihood for earth materials and construction equipment to be contaminated. Wind, precipitation, and inadvertent transport on public and project vehicles may disperse seeds from these sources into areas where surface disturbance has occurred within the analysis area.

   Existing noxious weed infestations located outside of the analysis area but within 2 miles of the centerline of the ROW/easement would represent potential seed sources. The risk

for the spread of noxious weed species is described in the Noxious Weed Risk Assessment (JBR Environmental Consultants, Inc. 2013).

To reduce the potential for the introduction of noxious weeds, the design features NW 1 through NW 12 and RT 10 would be implemented prior to, during, and following construction activities. RT 10 would prevent the construction of temporary new access roads in areas heavily infested with noxious or invasive weeds. Per NW 2, all noxious weed infestations within the ROW/easement and in other areas where surface disturbance is proposed be identified, mapped, and treated prior to commencement of construction activities. The design feature extends the treatment on NFS land and BLM-administered land to include areas within 100 feet of the ROW/easement boundaries and areas where surface disturbance is proposed. Monitoring and treatment of noxious weeds would continue, beginning the first full growing season after construction activities commence, in weed infested areas and along the transmission line ROW/easement area per NW 3. Treatment would continue until disturbed areas are successfully reclaimed, which is typically 3 to 5 years, but may be longer depending on the productivity of the reclamation site. A noxious weed monitoring plan would be developed by NV Energy and included as part of the COM Plan.

Implementation of NW 4 would require that all project vehicles and construction equipment utilized off existing roads and trails be cleaned with a power washer of all mud, dirt, and plant parts prior to moving equipment onto NFS land or BLM-administered public land. Vehicles and equipment would be cleaned again if it leaves the project site prior to reentry and before moving from an area with known or documented noxious weed infestations. Following each cleaning, all project vehicles and equipment would be inspected for plant parts (e.g., mud, leaves, stems, seeds) before moving onto NFS land or BLM-administered public land.

4. **Damage from authorized OHV use.** On reclaimed centerline travel roads and other reclaimed access roads and road widening areas, re-vegetation success and recovery of vegetation communities would be slow if repeated damage from unauthorized OHV use occurs. Unauthorized OHV use on restored access roads may introduce noxious and invasive weeds to the analysis area. Restored vegetation would potentially be crushed or damaged, and bare soil would be exposed. The combination of disturbed soils and loss of reclamation vegetation would create optimal conditions for infestations of noxious weeds, especially if seeds are brought in by the OHV.

The implementation of design features RT 3 through RT-8 would reduce the potential for unauthorized travel on reclaimed roads. Implementation of RT 5 would require all new temporary construction access roads constructed on NFS land to be reclaimed immediately following construction. RT 3 and RT 4 would require that all new temporary access roads specifically constructed for the proposed project have a physical closure (i.e., barricade) installed immediately following construction to prevent unauthorized vehicle use from occurring on reclaimed roads. Implementation of RT 7 would require a signage and monitoring plan for compliance with closure of reclaimed roads. The monitoring plan would include inspecting the physical closure for effectiveness at preventing motorized vehicle use of the reclaimed access roads. Per RT 8, if unauthorized vehicle use occurs on reclaimed roads, USFS OHV rangers would monitor the reclaimed roads under a cost recovery agreement with NV Energy. Monitoring would continue until the roads are successfully reclaimed and no longer appear as potential opportunities for OHV travel.

General Effect to Shrub- and Grass-Dominated Vegetation Communities

The short-term and long-term impacts from clearing shrub- and grass-dominated vegetation communities would be minor because the affected communities are locally and regionally abundant. According to CALVEG data (USFS 2005; 2008), there are approximately 31,925 acres of Bitterbrush-Sagebrush mapped within 5 miles of the variable-width corridor analysis area. There are at least 1,200 acres of each of the other shrub- and grass-dominated communities that mapped within 5 miles of the analysis area, with the exception of the Wet Meadow and Willow vegetation communities. There are approximately 294 acres of Wet Meadow and approximately 709 acres of Willow vegetation community within 5 miles of the analysis area (USFS 2005; 2008).

General Effects to Forest Vegetation Communities

Trees are not expected to return to the forest vegetation communities that are impacted by certain project activities. The loss of the tree component to forest communities is considered a long-term loss of the forest vegetation community. Within the transmission line clearance area, the continued clearing of trees within Eastside Pine, Jeffery Pine, Mixed Conifer-Fir, Plantation, and Quaking Aspen vegetation communities during the operation and maintenance phase of the project would preclude the regrowth of trees for the operational life of the project. Within the centerline access road, spur roads, and road widening areas that are outside of line clearance areas, trees may not return, depending on the frequency at which these roads were travelled during construction and whether and how often these areas must be disturbed for maintenance of the project. As a worst-case scenario, it is assumed that although new access roads and road widening areas would be restored after construction, reforestation would be precluded. Shrub- and grass-dominated vegetation communities would be anticipated to colonize areas where

reforestation is precluded. While the acreage of impacts to forest vegetation community from road widening is presented for each action alternative in **Sections 3.2.3** through **3.2.6**, the acreage of impacts to forest vegetation community from the construction of the centerline travel road and spur roads cannot be determined because their locations are not known. Instead, the acres of forest vegetation community within the variable width corridor is provided as an indication of the relative abundance of forest vegetation communities that may impacted by the construction of access roads.

The only areas where trees would return would be outside of line clearance areas at wire set-up sites and log landings. Forest vegetation communities in these areas would take several decades to reach the successional stage that had existed prior to construction.

The long-term impacts from clearing forest vegetation communities would be minor because the affected communities are locally and regionally abundant. Based on CALVEG data (USFS 2005; 2008), there are approximately 19,600 acres of Eastside Pine vegetation community, 9,980 acres of Mixed Conifer-Fir vegetation community, and approximately 7,960 acres of Plantation vegetation community within 5 miles of the analysis area. The same data indicates that there are approximately 168 acres of Jeffrey Pine vegetation community and approximately 348 acres of Quaking Aspen vegetation community that occur within 5 miles of the analysis area (USFS 2008).

Effects to Forest Product Resources

Removal of trees in forest communities would cause a reduction of forest product resources. Timber management within the ROW/easement would be precluded, as the Forest Plan (USFS 1986) specifies that NFS land developed with transmission lines are considered unsuitable for timber management. The loss of timber management areas would be long term. Firewood cutting within the transmission line clearance area would be precluded for the life of the project because trees would be removed from this area during construction and then routinely as needed for the life of the project. As previously described, the only areas where trees would return would be outside of line clearance areas at wire set-up sites and log landings. In these areas trees may reach sizes suitable for firewood or timber management cutting in fewer than 20 years following completion. Impacts to firewood cutting areas would generally be long term, because there would be few areas where reforestation would occur during the operational life of the project.

Direct and Indirect Effects from Herbicide Application

Vegetation- Non-target vegetation can be inadvertently exposed to herbicide through direct spray, downwind drift, runoff of chemical laden soil, and accidental spills. Exposure would cause death or damage to vegetation. During herbicide application, non-target vegetation immediately adjacent to noxious weed infestation treatment areas can be exposed to overspray. The magnitude of effects would be dependent on the specific herbicide product, timing of

application, the species that is exposed, and the volume or concentration of chemical exposure. To minimize the potential for overspray, design feature HE 13 requires that during spray applications, the spray nozzle would be kept as close to target plants as possible. Effects would be minor because overspray would be localized to the area within 5 feet of treated areas and would not be widespread because herbicide applications would for small isolated, infestations.

When spray applications are performed during periods of strong wind, the spray may drift with the wind currents and disperse downwind, landing on non-target plants. It is possible that sensitive plant species could be damaged or killed from spray drift if located near and downwind of noxious weed infestation treatments. The potential for drift would be reduced through design features HE 4 and HE 8. Design feature HE 8 requires the use of coarse droplet sizes to limit the presence of droplets small enough to be carried in the wind. Design feature HE 4 prohibits spray applications when wind speed exceeds 5 miles per hour. Additional design features exclude herbicide spray applications near streams, meadows, wetlands, and riparian zones (HE 6, HE 14, HE 17, and HE 18). Effects would be minor because design features ensure that drift would be localized to the proximity of treated areas and would not be widespread because herbicide applications would for small isolated, infestations.

No effects to specials status species would be expected because special status plants are not known to occur within the analysis area, and design features for special status plants prohibit ground disturbance within 500 meters of Webber ivesia or Dog Valley ivesia and within 200 feet of all other special status plants. Previously unknown special status plant populations may occur in road widening corridors where surveys have not been conducted. However, field surveys would be completed once an alternative is selected. If special status plant species are found, design feature HE 15 would prohibit herbicide spraying up to 500 feet from special status plant, depending on the type of herbicide used (**Table 1-3**). If these distances are maintained, no observable effects from herbicide exposures would be expected. Inside of the protective buffers, non-chemical methods would be used such as a string trimmer or hand pulling.

Aminopyralid, clopyralid, chlorsulfuron, and imazapic have pre-emergent properties (i.e., remain active in the soil) and may reach non-target vegetation by wind or water transport. Off-target movement from runoff was modeled in the SERA Herbicide Risk Assessments, and was not identified as a concern for chlorsulfuron or imazapic (SERA 2004a; 2004c). However the risk assessments indicated off-target movement from runoff was a concern for clopyralid and aminopyralid (SERA 2004b; 2007). The potential for off-target movement is greatest for aminopyralid and clopyralid because these chemicals are applied direct to the soil. The potential for movement is reduced through design feature HE 20, which prohibits spot (soil) applications of aminopyralid and clopyralid on soils prone to runoff, and design feature HE 23, which prohibits spot applications for all other herbicides.

There is always a remote risk of accidental spills. To limit the potential for herbicide spills next to sensitive plant occurrences or within wetlands, meadows, and riparian zones, design feature HE 6 would be implemented. This design features ensures that mixing and loading of herbicides would occur outside of sensitive vegetation communities. Additionally, design feature HE 2 would require the regular inspection and testing of all equipment used for herbicide application and HE 7 would require that a small spill containment kit be readily available whenever chemicals are transported or stored.

Damage to vegetation from direct exposure, drift, and accidental spills would be minor because the affected area would be small and localized. Effects would be short term because plants would recover or new growth would replace the plants that were inadvertently killed.

Wildlife- Effects to wildlife include disturbance, habitat alteration, and toxicity from exposure or consumption of herbicides. Disturbance to wildlife during weed control activities would be minimal as treatment would not be likely to exceed a single day within a given area. Disturbance to nesting migratory birds during the breeding season would be avoided by design features requiring pre-construction surveys for nesting birds if construction occurs between April 1 and July 31.

Alteration of wildlife habitat from removal of invasive weed cover would generally be small and patchy, based on findings of field surveys completed by JBR Environmental Consultants, Inc. in 2012 and 2013. Noxious weed GIS data obtained from the USFS and other sources indicate that polygon sizes for certain weeds that cross the variable width corridor are quite large, including a medusahead population that measures approximately 16 acres in size along the Peavine Alternative, and a scotch thistle infestation near Bull Ranch Creek that is approximately 134 acres in size along the Peavine/Poeville and Poeville Alternative. However, field surveys confirm the size of the reported infestations is much smaller, indicating that the GIS data is probably outdated or overstated. Loss of habitat from noxious weed control would be short term, and habitat would be restored as success criteria are achieved and weeds are replaced by native vegetation. Large infestations of invasive plants do not support healthy wildlife populations and the long term benefits from restoring native plant communities outweigh the short-term impacts of removing non-native vegetation cover.

SERA risk assessments for wildlife consider the following scenarios: accidental acute exposure from direct spray or herbicide spill; non-accidental acute exposures from sprayed vegetation and chemical laden water, or consumption of herbicide-laden food sources; and chronic/longer term exposures associated with consumption of contaminated vegetation, water, or fish. Effects on wildlife and other organisms were considered insignificant and discountable when herbicide exposure was below the threshold of concern. The threshold of concern is the level of exposure below which there is a low potential for adverse effects to an organism.

For mammals and birds, SERA risk assessments show chlorsulfuron, clopyralid, imazapic, aminopyralid, and glyphosate have effects below the threshold of concern for both acute and chronic exposures (SERA 2004a; 2004b; 2004c; 2007; 2011a). Toxicity effects of triclopyr exceeded the threshold of concern for consumption of contaminated vegetation by mammals and consumption of contaminated vegetation or contaminated insects by a small bird (10 grams) (SERA 2011b). However, the magnitude of risk for mammals and birds is overstated and exposure scenarios are implausible because the SERA risk assessment assumes that 100 percent of the animal's diet is made up of contaminated vegetation consumed within a 24-hour period. For chronic exposure, the SERA risk assessment assumes 30 percent of the animal's diet would come from contaminated vegetation or insects consumed over a 90-day period. This possibility is remote since treated plants would rapidly brown and die, and would not remain palatable or available as forage for more than about five to ten days following treatments. All exposure scenarios for a large bird, such as an eagle, are below the threshold of concern.

SERA risk assessments for aquatic species shows that most of the concern for aquatic species is associated with exposures scenarios from an accidental spill. However, the magnitude of risk for aquatic species is overstated and based on a 20- to 200-gallon spill rather than a 5-gallon spill, which is the standard capacity of back-pack sprayers that would typically be used. The risk of spill into a stream is remote because design feature HE 6 requires that the preparation of herbicide for application, including mixing, filling of wands and rinsing of spray equipment, take place outside of wetlands, meadows, riparian zones and other sensitive sites, and more than 300 feet from surface water.

Soil and Water- Soil and water resources can be affected by herbicide through direct spray, runoff of chemical laden soil, and accidental spills. Adsorption on soil, solubility in water, degradation rates, toxicity to microbes, and activation mechanism of the herbicide were considered in the SERA risk assessments. Based on the intended use rates, SERA risk assessments indicate that the proposed herbicides would have a low risk for adversely impacting the soil biota.

All six proposed herbicides are highly soluble in water. The risk for runoff is within the first 24-hour period, and on steep areas where erosive overland flows could be generated. Runoff is avoided through implementation of design feature HE 5 that delay weed treatment if the forecast exceeds a 30 percent chance for rain. Design feature HE 21 prohibits the use of herbicide on deep, coarse textured soils prior to snow melt. Aminopyralid and clopyralid have the highest water solubility and design feature HE 20 would prohibit the spot application of aminopyralid and clopyralid, including equipment rinsing, on soils with low infiltration rates and soils with an impermeable bedrock layer less than 48 inches deep in well drained, sandy soils.

Leaching was not found to be a concern since herbicide is applied to directly to foliage and application is during the dry season. Output from modeling in the SERA assessments indicated that herbicides mostly stayed in the upper 12 inches of soil, limiting the ability of herbicide to contaminate ground water.

Effects to wildlife from disturbance would be negligible and temporary because weed control activities at a given location would not be expected to last more than a day. Effects from habitat alteration would be minor because most infestations are small, and the few large infestations that exist do not currently support high quality habitat. Effects would be short term because vegetation would be restored allowing habitats would recover. With the application of design features, effects to wildlife from herbicide toxicity would be negligible and short term as effects are below the threshold of concern acute and chronic exposure scenarios are remote.

Human Health- According to the SERA risk assessment, effects from acute and chronic exposure to imazapic and aminopyralid for workers are below a threshold of concern (SERA 2004c; 2007). For chlorsulfuron, clopyralid, and glyphosate, occupational exposures as well as accidental exposures scenarios are also below a level of concern (SERA 2004a; 2004b; 2011a). However, from exposure to relatively high levels (i.e., placement directly onto the eye or skin) chlorsulfuron, and glyphosate formulations are irritants to the skin and eyes. Clopyralid can result in irritation and damage to the skin and eyes. From a practical perspective, eye or skin irritation is likely to be the only overt effect as a consequence of mishandling chemicals by workers. These effects can be minimized or avoided by prudent industrial hygiene practices during the handling of the compound. For triclopyr, under typical application conditions, levels of exposure will be well below levels of concern. However, ocular exposure to the triclopyr formulations is characterized in material safety data sheets variously as "Irreversible", "Corrosive/Irreversible", or "Corrosive". These effects can be minimized or avoided by prudent industrial hygiene practices during the handling of herbicide. Design feature HE 1 and HE 3 require herbicide to be applied by trained or certified applicators and in accordance with label instructions.

Exposure to aminopyralid and imazapic by the general public acute/accidental scenarios and the long-term/chronic exposures, were below a level of concern indicating little hazard to the general public from application of these pesticides. For chlorsulfuron, clopyralid, glyphosate, and triclopyr, typical levels of exposure by the general public is below level of concern. However, the consumption of treated weeds, staying in contact with treated weeds, eating contaminated fruit or vegetables, and eating contaminated fish would exceed a level of concern, but such exposure scenarios are extremely unlikely. Treated vegetation in older treated areas is expected to be dead, dying, chlorotic, brittle or deformed and hence undesirable to consume in the long term. To reduce the potential that freshly sprayed material would be consumed, design feature HE 11 and HE 12 requires that signs at likely access points informing the public that an area has

been sprayed be used, and that treatments in areas where public use is concentrated be avoided during holidays.

Herbicide toxicity effects to workers would be negligible and short term with implementation of design features and proper use and handling of herbicides by trained workers. SERA risk assessments report that effects are below the threshold of concern meaning the effect would not be noticeable. Effects to the public would also be negligible and short term. Effects would be below the threshold of concern and the possibility of acute and chronic exposure scenarios extremely remote.

3.2.2.2 Operation and Maintenance

Under all action alternatives, temporary disturbance to vegetation would periodically occur during the operation and maintenance phase of the project. Annual inspections of the transmission line to determine if maintenance is needed would be from helicopter or from walking to the pole structures from existing roads. Neither of these inspections methods would be anticipated to impact vegetation communities. The inspection involving climbing pole structures that is anticipated once every 10 years or after unexplained outages or significant natural events may be from existing roads using pickup trucks or an all-terrain OHV. Vegetation, particularly woody shrubs may be crushed or damaged beneath the tires of the vehicles during these inspections. The damage to individual shrubs and other vegetation within the travel path of the inspection vehicles would be negligible relative to the abundance and health of the vegetation communities in which they occur. If inspections reveal that maintenance or repair is required, vegetation in the area surrounding the pole structure(s) in need of repair may be damaged or removed. The area which may be affected would depend on the type of repair activities required, but would typically be smaller than the area of the pole sites required during construction.

Removal of trees from within the transmission line clearance area (i.e., trees beneath and within 21 feet of either side of the conductors), as well as any other trees with potential to fall onto the conductors or pole structures would routinely continue as needed through the operational life of the project. Because all trees would be removed from the clearance area for the operational life of the project, impacts on forest vegetation communities within the clearance area would be long term (permanent). Timber management activities within the ROW/easement would continue to be precluded, and fire cutting would also be precluded but only within the transmission line clearance area and areas where access roads were widened or created during construction. Impact intensity would be the same as described for construction because the area precluded would not change between the construction phase and the operation and maintenance phase.

Inspections and maintenance activities would have the potential for inadvertent introduction of noxious and invasive weeds. The potential for introduction and infestation would be related to the use of project vehicles and equipment contaminated with noxious weed seeds, and from

temporary surface disturbance required for maintenance or repair activities. The potential for introduction of noxious weeds during the maintenance phase would be much less than during the construction phase because of the limited equipment required for inspections and maintenance and the limited surface disturbance required for typical maintenance or repair activities.

Design features (**Section 1.2.4**) implemented during construction would also apply to the operations and maintenance phase of the project. Each disturbance episode to vegetation would be followed by restoration of vegetation, weed control, and stabilization of soils, if needed. With reclamation of disturbances and implementation of BMPs and design features, direct and indirect effects from the loss of vegetation communities would continue to be minimized, and impacts would range from negligible to minor, but would be long term. Impacts from noxious weed infestations would occur from maintenance of any of the action alternatives, and would be negligible due to implementation of design features, but long term.

Herbicide Use

Design features (**Section 1.2.4**) implemented during operation and maintenance would continue to protect vegetation, wildlife, soils, and human health from herbicide exposure.

Noxious weed control and the use of herbicides would be infrequent during the operation and maintenance phase because repairs that cause ground disturbance would be infrequent and generally minimal in size. The areas where major repairs would be needed is unknown, but disturbance areas would be localized and occur on disturbances that were reclaimed during the construction phase of the project.

3.2.3 Mitchell Alternative

3.2.3.1 Construction

Shrub- and Grass-Dominated Vegetation Communities

Shrub- and grass-dominated vegetation communities would be cleared within the ROW/easement area, road widening corridor, and variable-width corridor as needed for new access roads, widening of existing roads, wire setup sites, staging areas or any other surface disturbance required for construction of the project. The acres of these communities within the ROW/easement area and both corridor areas are presented in **Table 3-2**. As described in **Section 3.2.2.1**, the short-term and long-term impacts from clearing shrub- and grass-dominated vegetation communities would be minor because the affected communities are locally and regionally abundant.

Table 3-2 Mitchell Alternative: Shrub- and Grass-Dominated Vegetation Communities

Vegetation Community	ROW/Easement Area (acres)		Road Widening Corridor (acres)		Variable-Width Corridor (Excluding ROW/Easement) (acres)		Total (acres)1	
	NFS Land	All Land	NFS Land	All Land	NFS Land	All Land	NFS Land	All Land
Annual Grasses and Forbs	2.2	2.3	0	1.2	17.5	18.6	19.7	22.1
Big Sagebrush	0	3.7	0	0.2	0	15.3	0	19.2
Bitterbrush-Sagebrush	25.0	48.1	4.1	10.3	145.9	223.3	175	281.7
Chaparral	15.1	15.1	0.7	0.7	81.9	84.7	97.7	100.5
Curl-Leaf Mountain Mahogany	0.9	0.9	0	0	3.8	3.8	4.7	4.7
Great Basin Mixed Scrub	7.3	7.3	0.1	0.2	41.8	41.8	49.2	49.3
Low Sagebrush	1	2.3	0	0	3.2	8.2	4.2	10.5
Mountain Sagebrush	0	0	0.5	0.7	0	0.9	0.5	1.6
Ruderal	0.2	2.0	0	0.2	0.2	2.9	0.4	5.1
Snowbrush	0.5	0.7	0	0	9.3	15.2	9.8	15.9
Wet Meadow	0	2.3	0	0.1	0.5	8.5	0.5	10.9
Willow	0	0.2	1.0	1.0	0.1	2.7	1.1	3.9
TOTAL:	**52.2**	**84.9**	**6.4**	**14.6**	**304.2**	**425.9**	**362.8**	**525.4**

[1] Sum of acreages in the road widening corridor and the variable-width corridor, including the ROW/easement area.

Forest Vegetation Communities

Table 3-3 presents the estimated acres of forest vegetation communities that would be cleared as a result of each major project construction activity or disturbance, and whether reforestation would be precluded following construction.

Table 3-3 Mitchell Alternative: Clearing Required in Forest Vegetation Communities

Construction Activity/ Disturbance	Clearing in Forest Communities (acres)[1]		Subject to Reforestation Following Construction
	NFS Land	All Land	
Transmission Line Clearance Area[2]	38.9	41.8	No
Widening existing roads[3]	5.1	5.4	No
New Construction Access Roads	Unknown	Unknown	No
Expansion of the Bordertown Substation Facility	0	0	Not Applicable
Other Surface Disturbance (e.g., pole sites, staging areas, wire setup sites, etc.)	Unknown	Unknown	Yes
TOTAL[4]:	**44.0**	**47.2**	

[1] Includes Eastside Pine, Jeffrey Pine, Mixed Conifer-Fir, Plantation, and Quaking Aspen vegetation communities.

[2] Transmission line clearance area was assumed to be the 90-foot-wide ROW/easement area.

[3] Excluding forest vegetation communities within the transmission line clearance area.

[4] Does not include "unknown" acreages.

Because it is unknown where new construction access roads and other construction-related surface disturbance (e.g., pole sites, staging areas, landings, etc.) would be located within the

variable-width corridor, the acres of forest vegetation communities that are present within the variable-width corridor would represent the best possible estimation of impacts. **Table 3-4** presents the acres of forest vegetation communities within the variable-width corridor.

Table 3-4 Mitchell Alternative: Forest Vegetation within the Variable-Width Corridor

Vegetation Community	Variable-Width Corridor[1] (acres)	
	NFS Land	All Land
Eastside Pine	116.9	121.7
Jeffrey Pine	0.2	9.4
Mixed Conifer-Fir	14.5	14.5
Plantation	56.3	56.6
Quaking Aspen	10.5	10.5
TOTAL:	**198.4**	**212.7**

[1] Does not include ROW/easement area or road widening corridor. See **Table 3-3** for impacts within these areas.

As described in **Section 3.2.2.1**, clearing of forest vegetation communities would have negligible long-term impacts because the affected communities are locally and regionally abundant. Impacts may be considered permanent in some areas because reforestation may be precluded beyond the operation life of the project.

Forest Product Resources

Approximately 35.6 acres of NFS land designated as suitable timber management area would be eliminated from the implementation of the Mitchell Alternative. The long-term impacts on suitable timber management area from the loss of 35.6 acres would be moderate.

Approximately 44 acres of potential firewood cutting area would be eliminated from tree clearing within the transmission line clearance area and from within road widening areas. There are approximately 198.4 acres of forest vegetation communities within the variable-width corridor on NFS land through which new access roads may be constructed. Potential firewood cutting area would also be eliminated from the tree clearing required for new access roads crossing these communities. Long-term impacts would be negligible because of the relatively minor size of potential firewood cutting area affected.

Noxious Weeds

There are approximately 6.4 acres of known noxious weed infestations and 30 infestations of an unknown size within the analysis area for the Mitchell Alternative (**Table 2-9**). As **Table 2-8** shows, there are approximately 4,529 acres of known noxious weed infestations and another 256 infestations of unknown size within 2 miles of the centerline of the ROW/easement for the Mitchell Alternative (**Figure 4**).The likelihood of weed infestations would be minimal with the effective implementation of design features as explained in **Section 3.2.2.1,** and because of the relatively small portion of the analysis area that is known to be infested with noxious weeds.

3.2.3.2 Operation and Maintenance

The impacts associated with operation and maintenance of the Mitchell Alternative include those common to all alternatives as described in **Section 3.2.2.2**, and a continuation of the long-term construction impacts on forest vegetation communities and forest product resources as described in **Section 3.2.3.1**.

3.2.4 Peavine Alternative

3.2.4.1 Construction

Shrub- and Grass-Dominated Vegetation Communities

Shrub- and grass-dominated communities would be cleared from the road widening corridor and as needed from the ROW/easement and variable-width corridor for pole sites, wire setup sites, landings, skid trails, and new access roads. The acres of shrub- and grass-dominated vegetation communities within the ROW/easement area, road widening corridor, and variable-width corridor areas are presented in **Table 3-5**. As described in **Section 3.2.2.1**, the short-term and long-term impacts from clearing shrub- and grass-dominated vegetation communities would be minor because the affected communities are locally and regionally abundant.

Table 3-5 Peavine Alternative: Shrub- and Grass-Dominated Vegetation Communities

Vegetation Community	ROW/Easement Area (acres)		Road Widening Corridor (acres)		Variable-Width Corridor (Excluding ROW/Easement) (acres)		Total (acres)1	
	NFS Land	All Land	NFS Land	All Land	NFS Land	All Land	NFS Land	All Land
Annual Grasses and Forbs	2.5	2.6	0.4	3.4	15.2	16.3	18.1	22.3
Big Sagebrush	0	3.8	0	0.3	0.7	15.9	0.7	20
Bitterbrush-Sagebrush	33.3	56.4	12.9	25.8	195.3	274.4	241.5	356.6
Chaparral	14.5	14.5	1.2	1.2	78.2	80.3	93.9	96.0
Curl-Leaf Mountain Mahogany	1.5	1.5	0	0.2	6.3	6.3	7.8	8.0
Great Basin Mixed Scrub	4.7	4.7	0	0.1	22.6	24.2	27.3	29
Low Sagebrush	0.9	2.2	0.3	0.4	4.8	9.8	6.0	12.4
Mountain Sagebrush	0	0	0.5	0.7	0	0.9	0.5	1.6
Ruderal	0.2	2.0	0	2.6	0.3	2.9	0.5	7.5
Snowbrush	0.5	0.7	0	0	5.7	11.6	6.2	12.3
Wet Meadow	0	2.3	0	0.1	0	8.0	0	10.4
Willow	0	0.2	1.1	1.3	0.1	2.7	1.2	4.2
TOTAL:	**58.1**	**90.9**	**16.4**	**36.1**	**329.2**	**453.3**	**403.7**	**580.3**

[1] Sum of acreages in the road widening corridor and the variable-width corridor, including the ROW/easement area.

Forest Vegetation Communities

Table 3-6 presents the estimated acres of forest vegetation communities that would be cleared as a result of each major project construction activity or disturbance, and whether reforestation would be precluded following construction.

Table 3-6 Peavine Alternative: Clearing Required in Forest Vegetation Communities

Construction Activity/ Disturbance	Clearing in Forest Communities (acres)[1]		Subject to Reforestation Following Construction
	NFS Land	All Land	
Transmission Line Clearance Area[2]	18.4	21.4	No
Widening existing roads[3]	9.4	10.9	No
New Construction Access Roads	Unknown	Unknown	No
Expansion of the Bordertown Substation Facility	0	0	Not Applicable
Other Surface Disturbance (e.g., pole sites, staging areas, wire setup sites, etc.)	Unknown	Unknown	Yes
TOTAL[4]:	**27.8**	**32.3**	

1 Includes Eastside Pine, Jeffrey Pine, Mixed Conifer-Fir, Plantation, and Quaking Aspen vegetation communities.

2 Transmission line clearance area was assumed to be the 90-foot-wide ROW/easement area.

3 Excluding forest vegetation communities within the transmission line clearance area.

4 Does not include "unknown" acreages.

Because it is unknown where new construction access roads and other construction-related surface disturbance (e.g., pole sites, staging areas, landings, etc.) would be located within the variable-width corridor, the acres of forest vegetation communities that are present within the variable-width corridor would represent the best possible estimation of impacts. **Table 3-7** presents the acres of forest vegetation communities within the variable-width corridor.

Table 3-7 Peavine Alternative: Forest Vegetation within the Variable-Width Corridor

Vegetation Community	Variable-Width Corridor[1] (acres)	
	NFS Land	All Land
Eastside Pine	69.1	72.3
Jeffrey Pine	0.7	9.8
Mixed Conifer-Fir	0	0
Plantation	14.9	15.1
Quaking Aspen	5.0	5.0
TOTAL:	**89.7**	**102.2**

1 Does not include ROW/easement area or road widening corridor. See **Table 3-6** for impacts within these areas.

As described in **Section 3.2.2.1**, clearing of forest vegetation communities would have negligible long-term impacts because the affected communities are locally and regionally abundant. Impacts may be considered permanent in some areas because reforestation may be precluded beyond the operation life of the project.

Forest Product Resources

Approximately 15.8 acres of NFS land designated as suitable timber management area would be eliminated from the implementation of the Peavine Alternative. The long-term impacts on suitable timber management area from the loss of 15.8 acres would be minor.

Approximately 27.8 acres of potential firewood cutting area would be eliminated from tree clearing within the transmission line clearance area and from within road widening areas. There are approximately 89.7 acres of forest vegetation communities within the variable-width corridor on NFS land through which new access roads may be constructed. Potential firewood cutting area would also be eliminated from the tree clearing required for new access roads crossing these communities. Long-term impacts would be negligible because of the relatively minor size of potential firewood cutting area affected.

Noxious Weeds

There are approximately 12.7 acres of known noxious weed infestations and 23 infestations of an unknown size within the analysis area for the Peavine Alternative (**Table 2-9**). As **Table 2-8** shows, there are approximately 4,535 acres of known noxious weed infestations and another 240 infestations of unknown size within 2 miles of the centerline of the ROW/easement for the Peavine Alternative (**Figure 5**).The likelihood of weed infestations would be minimal with the effective implementation of design features as explained in **Section 3.2.2.1,** and because of the relatively small portion of the analysis area that is known to be infested with noxious weeds.

3.2.4.2 Operation and Maintenance

The impacts associated with operation and maintenance of the Peavine Alternative include those common to all alternatives as described in **Section 3.2.2.2**, and a continuation of the long-term construction impacts on forest vegetation communities and forest product resources as described in **Section 3.2.4.1**.

3.2.5 Poeville Alternative

3.2.5.1 Construction

Shrub- and Grass-Dominated Vegetation Communities

Shrub- and grass-dominated communities would be cleared from the road widening corridor and as needed from the ROW/easement and variable-width corridor for pole sites, wire setup sites, landings, skid trails, and new access roads. The acres of shrub- and grass-dominated vegetation communities within the ROW/easement area, road widening corridor, and variable-width corridor areas are presented in **Table 3-8**. As described in **Section 3.2.2.1**, the short-term and long-term impacts from clearing shrub- and grass-dominated vegetation communities would be minor because the affected communities are locally and regionally abundant.

Table 3-8 Poeville Alternative: Shrub- and Grass-Dominated Vegetation Communities

Vegetation Community	ROW/Easement Area (acres)		Road Widening Corridor (acres)		Variable-Width Corridor (Excluding ROW/Easement) (acres)		Total (acres)1	
	NFS Land	All Land	NFS Land	All Land	NFS Land	All Land	NFS Land	All Land
Annual Grasses and Forbs	0	52.2	0.3	7.8	0.9	267.3	1.2	327.3
Big Sagebrush	1.2	11.5	0	0.8	2.7	28.0	3.9	40.3
Bitterbrush-Sagebrush	36.1	81.0	4.5	29.8	107.1	255.3	147.7	366.1
Chaparral	1.5	1.8	0.5	3.0	6.8	11.6	8.8	16.4
Curl-Leaf Mountain Mahogany	1.0	1.7	0.2	0.2	10.0	13.1	11.2	15.0
Great Basin Mixed Scrub	0	8.8	0	2.5	0.1	49.9	0.1	61.2
Low Sagebrush	0.3	0.7	0.1	0.1	2.7	5.2	3.1	6.0
Mountain Sagebrush	1.7	2.4	1.2	2.8	8.0	15.7	10.9	20.9
Ruderal	2.1	20.2	0	10.5	8.9	67.2	11.0	97.9
Snowbrush	0	0.9	0	0.1	0.8	4.1	0.8	5.1
Wet Meadow	0	0.8	0	0.1	0	2.1	0	3.0
Willow	0.3	1.7	0	0.1	3.6	7.1	3.9	8.9
TOTAL:	**44.2**	**183.7**	**6.8**	**57.8**	**151.6**	**726.6**	**202.6**	**968.1**

[1] Sum of acreages in the road widening corridor and the variable-width corridor, including the ROW/easement area.

Forest Vegetation Communities

Table 3-9 presents the estimated acres of forest vegetation communities that would be cleared as a result of each major project construction activity or disturbance, and whether reforestation would be precluded following construction.

Table 3-9 Poeville Alternative: Clearing Required in Forest Vegetation Communities

Construction Activity/ Disturbance	Clearing in Forest Communities (acres)[1]		Subject to Reforestation Following Construction
	NFS Land	All Land	
Transmission Line Clearance Area[2]	0	2.9	No
Widening existing roads[3]	0	1.2	No
New Construction Access Roads	Unknown	Unknown	No
Expansion of the Bordertown Substation Facility	0	0	Not Applicable
Other Surface Disturbance (e.g., pole sites, staging areas, wire setup sites, etc.)	Unknown	Unknown	Yes
TOTAL[4]:	**0**	**4.1**	

[1] Includes Eastside Pine, Jeffrey Pine, Mixed Conifer-Fir, Plantation, and Quaking Aspen vegetation communities.

[2] Transmission line clearance area was assumed to be the 90-foot-wide ROW/easement area.

[3] Excluding forest vegetation communities within the transmission line clearance area.

[4] Does not include "unknown" acreages.

Because it is unknown where new construction access roads and other construction-related surface disturbance (e.g., pole sites, staging areas, landings, etc.) would be located within the

variable-width corridor, the acres of forest vegetation communities that are present within the variable-width corridor would represent the best possible estimation of impacts. **Table 3-10** presents the acres of forest vegetation communities within the variable-width corridor.

Table 3-10 Poeville Alternative: Forest Vegetation within the Variable-Width Corridor

Vegetation Community	Variable-Width Corridor[1] (acres)	
	NFS Land	All Land
Eastside Pine	0	0.5
Jeffrey Pine	0.1	8.7
Mixed Conifer-Fir	0	0
Plantation	0	0
Quaking Aspen	0	4.7
TOTAL:	**0.1**	**13.9**

[1] Does not include ROW/easement area or road widening corridor. See **Table 3-9** for impacts within these areas.

As described in **Section 3.2.2.1**, clearing of forest vegetation communities would have negligible long-term impacts because the affected communities are locally and regionally abundant. Impacts may be considered permanent in some areas because reforestation may be precluded beyond the operation life of the project.

Forest Product Resources

Implementation of the Poeville Alternative would not eliminate any suitable timber management area designations. Approximately 0.1 acre of potential firewood cutting area would be eliminated from tree clearing associated with construction surface disturbance. Long-term impacts would be negligible because of the very minor area of potential firewood cutting area affected.

Noxious Weeds

There are approximately 34.3 acres of known noxious weed infestations and 115 infestations of an unknown size within the analysis area for the Poeville Alternative (**Table 2-9**). As **Table 2-8** shows, there are approximately 9,303 acres of known noxious weed infestations and another 252 infestations of unknown size within 2 miles of the centerline of the ROW/easement for the Poeville Alternative (**Figure 6**).The likelihood of weed infestations would be minimal with the effective implementation of design features as explained in **Section 3.2.2.1,** and because of the relatively small portion of the analysis area that is known to be infested with noxious weeds.

3.2.5.2 Operation and Maintenance

The impacts associated with operation and maintenance of the Poeville Alternative include those common to all alternatives as described in **Section 3.2.2.2**, and a continuation of the long-term construction impacts on forest vegetation communities and forest product resources as described in **Section 3.2.5.1**.

3.2.6 Peavine/Poeville Alternative

3.2.6.1 Construction

Shrub- and Grass-Dominated Vegetation Communities

Shrub- and grass-dominated communities would be cleared from the road widening corridor and as needed from the ROW/easement and variable-width corridor for pole sites, wire setup sites, landings, skid trails, and new access roads. The acres of shrub- and grass-dominated vegetation communities within the ROW/easement area, road widening corridor, and variable-width corridor areas are presented in **Table 3-11**. As described in **Section 3.2.2.1**, the short-term and long-term impacts from clearing shrub- and grass-dominated vegetation communities would be minor because the affected communities are locally and regionally abundant.

Table 3-11 Peavine/Poeville Alternative: Shrub- and Grass-Dominated Vegetation Communities

Vegetation Community	ROW/Easement Area (acres)		Road Widening Corridor (acres)		Variable-Width Corridor (Excluding ROW/Easement) (acres)		Total (acres)1	
	NFS Land	All Land	NFS Land	All Land	NFS Land	All Land	NFS Land	All Land
Annual Grasses and Forbs	0.2	30.7	0.3	4.4	8.7	145.6	9.2	180.7
Big Sagebrush	0	3.8	0	0.4	0.7	15.7	0.7	19.9
Bitterbrush-Sagebrush	20.4	51.9	11.1	28.1	107.5	195.5	139	275.5
Chaparral	13.7	15.1	1.1	3	77.2	83.2	92	101.3
Curl-Leaf Mountain Mahogany	1.1	1.1	0	0.2	4.9	4.9	6.0	6.2
Great Basin Mixed Scrub	0	0	0	2.3	0	0	0	2.3
Low Sagebrush	1.5	3.7	0	0	8.9	18.3	10.4	22.0
Mountain Sagebrush	0	0	1.3	3.0	0	0.9	1.3	3.9
Ruderal	0	4.6	0	8.1	0	12.0	0	24.7
Snowbrush	0.5	0.7	0	0.1	5.7	11.6	6.2	12.4
Wet Meadow	0	3.0	0	0	0	9.4	0	12.4
Willow	0.1	1.5	1.1	1.3	1.0	5.4	2.2	8.2
TOTAL:	**37.5**	**116.1**	**14.9**	**50.9**	**214.6**	**502.5**	**267.0**	**669.5**

[1] Sum of acreages in the road widening corridor and the variable-width corridor, including the ROW/easement area.

Forest Vegetation Communities

Table 3-12 presents the estimated acres of forest vegetation communities that would be cleared as a result of each major project construction activity or disturbance, and whether reforestation would be precluded following construction.

Table 3-12 Peavine/Poeville Alternative: Clearing Required in Forest Vegetation Communities

Construction Activity/ Disturbance	Clearing in Forest Communities (acres)[1]		Subject to Reforestation Following Construction
	NFS Land	All Land	
Transmission Line Clearance Area[2]	9.1	12.1	No
Widening existing roads[3]	4.5	6.0	No
New Construction Access Roads	Unknown	Unknown	No
Expansion of the Bordertown Substation Facility	0	0	Not Applicable
Other Surface Disturbance (e.g., pole sites, staging areas, wire setup sites, etc.)	Unknown	Unknown	Yes
TOTAL[4]:	**13.6**	**18.1**	

1 Includes Eastside Pine, Jeffrey Pine, Mixed Conifer-Fir, Plantation, and Quaking Aspen vegetation communities.

2 Transmission line clearance area was assumed to be the 90-foot-wide ROW/easement area.

3 Excluding forest vegetation communities within the transmission line clearance area.

4 Does not include "unknown" acreages.

Because it is unknown where new construction access roads and other construction-related surface disturbance (e.g., pole sites, staging areas, landings, etc.) would be located within the variable-width corridor, the acres of forest vegetation communities that are present within the variable-width corridor would represent the best possible estimation of impacts. **Table 3-13** presents the acres of forest vegetation communities within the variable-width corridor.

Table 3-13 Peavine/Poeville Alternative: Forest Vegetation within the Variable-Width Corridor

Vegetation Community	Variable-Width Corridor[1] (acres)	
	NFS Land	All Land
Eastside Pine	36.1	36.5
Jeffrey Pine	10.7	21.3
Mixed Conifer-Fir	0	0
Plantation	0	0
Quaking Aspen	5.3	7.2
TOTAL:	**52.1**	**65.0**

1 Does not include ROW/easement area or road widening corridor. See **Table 3-12** for impacts within these areas.

As described in **Section 3.2.2.1**, clearing of forest vegetation communities would have negligible long-term impacts because the affected communities are locally and regionally abundant. Impacts may be considered permanent in some areas because reforestation may be precluded beyond the operation life of the project.

Forest Product Resources

Approximately 8 acres of NFS land designated as suitable timber management area would be eliminated from the implementation of the Peavine/Poeville Alternative. The long-term impacts on suitable timber management area from the loss of 8 acres would be minor.

Approximately 13.6 acres of potential firewood cutting area would be eliminated from tree clearing within the transmission line clearance area and from within road widening areas. There are approximately 52.1 acres of forest vegetation communities within the variable-width corridor on NFS land through which new access roads may be constructed. Potential firewood cutting area would also be eliminated from the tree clearing required for new access roads crossing these communities. Long-term impacts would be negligible because of the relatively minor size of potential firewood cutting area affected.

Noxious Weeds

There are approximately 30.3 acres of noxious weed infestations and 109 infestations of an unknown size within the analysis area for the Peavine/Poeville Alternative (**Table 2-9**). As **Table 2-8** shows, there are approximately 6,299 acres of noxious weed infestations and another 247 infestations of unknown size within 2 miles of the centerline of the ROW/easement for the Peavine/Poeville Alternative (**Figure 7**).The likelihood of weed infestations would be minimal with the implementation of design features as explained in **Section 3.2.2.1,** and because of the relatively small portion of the analysis area that is known to be infested with noxious weeds.

3.2.6.2 Operation and Maintenance

The impacts associated with operation and maintenance of the Peavine/Poeville Alternative include those common to all alternatives as described in **Section 3.2.2.2**, and a continuation of the long-term construction impacts on forest vegetation communities and forest product resources as described in **Section 3.2.6.1**.

3.4 CUMULATIVE EFFECTS

Cumulative effects (i.e., cumulative impacts) are defined at 40 CFR 1508.7 as:

> *"The impact which results from the incremental impact of the action, decision, or project when added to the other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time".*

In accordance with the definition above, this section addresses the potential cumulative effects that would result from the implementation of the No Action Alternative and action alternatives when added to the other past, present, and reasonably foreseeable future actions within the cumulative impacts analysis area (CIAA).

3.4.1 Cumulative Impact Analysis Area

The boundaries of the CIAA include the areas within 2 miles of either side of the centerline of the alignment for each action alternative, and areas within two miles of the California and Bordertown substations (**Figure 9)**. The CIAA includes the variable-width corridor and road widening corridor analysis areas for all of the action alternatives. This area was selected as the CIAA because the No Action Alternative and the action alternatives would be unlikely to have any measureable incremental effects on vegetation resources beyond 2 miles from an alternative.

3.4.2 Past and Present Actions

Present actions include actions that are presently occurring as well as past actions that occurred in the CIAA. Past actions are grouped with present actions because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected vegetation resources and might contribute to cumulative effects.

The present actions considered in the cumulative impacts analysis include those which have impacts on vegetation resources that are similar to those anticipated from implementation of the action alternatives or No Action Alternative. Where possible and appropriate, the surface disturbance impacts of the present actions were measured using GIS data obtained from the USFS or from interpretation of aerial imagery. Quantifying the surface disturbance from present actions allows for the surface disturbance from the action alternatives to be considered cumulatively with regards to impacts on vegetation communities in the CIAA. The present actions that could be quantified in terms of surface disturbance are presented in **Table 3-14**. A description of the present actions considered in the cumulative effects analysis, including those for which surface disturbance is unknown follows the table.

Table 3-14 Estimated Surface Disturbance from Present Actions in the CIAA

Present Actions	Miles and/or acres	Percent of CIAA (63,488 acres)
Urban development	3,010 acres	5
Transportation network	486 miles/1,178 acres	2
Buried pipelines	9 miles/27 acres	<0.1
Transmission lines and substations	27 miles/295 acres	0.5
Mining	25 acres	<0.1
Wildfire and wildfire suppression (2000 to 2012)	8,048 acres	13
Forest plantations (1980 to present)	2,158 acres	3

Present Actions	Miles and/or acres	Percent of CIAA (63,488 acres)
Prescribed fire	381 acres	0.6
Mastication	769 acres	1
Timber sales (1990 to present)	3,811 acres	6
Firewood cutting	195 acres	0.3

Urban development – Urban development includes the residential, commercial, and industrial structures and associated infrastructure (e.g. parking lots, driveways, etc.). Impacts on vegetation resources from urban development are associated with the permanent removal of native vegetation communities that are displaced by structures and associated infrastructure. Urban development has affected approximately 3,010 acres (5 percent) of the CIAA (**Table 3-14**). It is unknown what native vegetation communities were impacted from urban development within the CIAA. However, nearly all of the urban development within the CIAA has occurred on private land and most has been concentrated in areas within proximity to either Interstate 80 or U.S. Highway 395. Residential urban development within the CIAA includes suburban communities as well as scattered residences in more rural settings. The largest suburban communities within the include Verdi, Somersett, Bordertown, and Silver Lake. Some of the larger commercial and industrial developments within the CIAA include the Gold Ranch Casino, Cabela's retail store, Chevron and Boomtown Casino, Bordertown Casino and RV Resort, and J.C. Penny Distribution Center.

Transportation network – The transportation network consists of the paved and unpaved roads and trails that cross or occur within the CIAA and are travelled by motorists. As **Table 3-14** shows, approximately 486 miles of roads and trails have been constructed within the CIAA. Interstate 80 and U.S. Highway 395 are the major paved arterial roads within the CIAA. There are numerous minor arterial and collector roads that are either city-, county-, or state-maintained; and other minor roads that are privately maintained or are not actively maintained. Most of the roads that cross NFS land and BLM-administered public land within the CIAA are unpaved. NFS roads and trails that cross NFS land within the CIAA and are designated for public motorized travel appear on the MVUM (USFS 2011).

Native vegetation communities have been displaced by the roads and trails that comprise the transportation network within the CIAA. Using aerial imagery, it was determined that roads and trails within the CIAA have an average width of approximately 20 feet. The 20-foot-width includes the road surface (i.e., traveled way) and adjacent cut and fill slopes where vegetation cover has also been displaced. Based on an average width of approximately 20 feet, the 486 miles of transportation network within the CIAA have displaced approximately 1,178 acres of vegetation cover from the various vegetation communities.

OHV travel – Impacts on vegetation resources from legal or authorized OHV travel are generally limited to the inadvertent introduction or spread of noxious weed infestations. Impacts on vegetation resources from travel on NFS land that is either cross-country or on roads not shown on the MVUM include damage to native vegetation communities and the inadvertent introduction of noxious weeds. Acreage of disturbance within vegetation communities from unauthorized OHV travel cannot be easily calculated from aerial imagery, but is likely to be much less than the area of vegetation communities displaced from existing roads and motorized trails. The relative prevalence of existing roads and motorized trails may provide and indicator of unauthorized OHV travel because such travel typically originates from existing roads and trails.

Buried Pipeline – An approximately 9-mile long section of the Kinder Morgan buried gas pipeline is located within the CIAA. Although the pipeline is buried, there is an associated corridor on the ground surface that is roughly centered on the pipeline. The average width of the corridor measures approximately 25 feet based on aerial imagery. With an average width of approximately 25 feet, the corridor occupies approximately 27 acres of the CIAA.

The corridor does not contain any forest cover but approximately 7.5 acres of the corridor are surrounded by forest cover. This suggests that forest communities existed within the 7.5 acres of the corridor prior to the construction of the pipeline, but were permanently removed for operation of the pipeline. Removal of approximately 7.5 acres of forest communities impacted forest product resources by reducing the number of trees on NFS land.

Aerial imagery shows that shrub vegetation communities and communities dominated by forbs and grasses do occur within the corridor, including the 7.5-acre portion where forest communities were removed. However, the vegetation cover within the corridor is visibly different than surrounding shrub dominated communities and the communities dominated by forbs and grasses. The difference is likely due to disturbance of vegetation cover within the corridor that occurs from intermittent maintenance of the pipeline and the pipeline corridor. Maintenance disturbance would have direct effects on the succession of the vegetation communities within the corridor. Species composition and the structure of the communities within the corridor would also be impacted.

Transmission Lines – There are approximately 27 miles of existing transmission lines within the CIAA. Major transmission lines (120 kV or greater) within the CIAA consist of the Alturas 345 kV transmission line and numerous 120 kV transmission lines, including the #101, #102, #106, #114, #141, and #632 (inactive) transmission lines. Existing transmission lines are contained with a corridor, which based on aerial imagery, measures approximately 90 feet wide on average. With an average width of approximately 90 feet, transmission line corridors occupy approximately 295 acres of the CIAA.

Aerial imagery shows that shrub vegetation communities and communities dominated by forbs and grasses do occur within the corridors, but forest communities have been permanently removed. Removal of forest communities from the corridors has also reduced the total acreage of forest vegetation within the CIAA. The removal of forest communities on NFS land within transmission line corridors has adversely impacted forest product resources by reducing the number of trees available for firewood cutting or timber harvest.

Vegetation cover in areas where forest communities were removed has since been restored with shrub vegetation communities and communities dominated by grasses and forbs. It is likely that vegetation communities within other areas of the corridors are also from restoration that followed surface disturbance required for construction of the transmission lines. Thus, vegetation communities within the corridor are likely earlier succession than vegetation communities surrounding the corridor that would have generally been unaffected from construction disturbance.

Intermittent maintenance of the transmission lines requires a minimal amount of surface disturbance, generally limited to areas within the transmission line corridors. Surface disturbance from maintenance activities would result in removal of vegetation communities. Restoration of vegetation following maintenance has created further variation in the successions stages of vegetation communities.

Mining activities – Mining activity within the CIAA has been limited to approximately 25 acres located in the Poeville area, north and northeast of Peavine Peak. Impacts on vegetation resources are associated with the removal of native vegetation communities from surface disturbance required for mining activities. Vegetation mapping (USFS 2008) indicates that approximately 21.4 acres (86 percent) of the 25 acres of mining surface disturbance within the CIAA occurred in Bitterbrush-Sagebrush vegetation community.

Wildfire and wildfire suppression – Approximately 8,048 acres (13 percent) of the CIAA has burned in wildfires that occurred between 2000 and 2012 (**Table 3-14**). Areas within the CIAA that have burned in wildfires since 2000 are shown on **Figure 3**. The combination of wildfires in some areas of the CIAA and lack of wildfires (due to intensive suppression efforts) in other areas has had impacts on vegetation community succession. Areas of the CIAA protected from wildfire through suppression efforts for the past approximately 100 years have accumulated heavy fuels loads and have been targeted on NFS land for fuels reduction (USFS 2009). In some instances, other areas in the CIAA have burned multiple times in the past 10 to 15 years (e.g., Mitchell Canyon, Crystal, Peavine, and Verdi fires). Wildfires that have burned forest communities on NFS land within the CIAA have impacted forest product resources by reducing the volume of firewood, saw timber, Christmas trees and other forest products available for cutting or sale, respectively.

Areas that have burned multiple times, particularly in the more recent wildfires, were seeded using perennial grass species, but cheatgrass, and in some cases medusahead, have become predominant. Accordingly, wildfires have also had indirect impacts on vegetation resources associated with the introduction of noxious weed infestations. It is possible that seeds of noxious weeds have been inadvertently transported into the CIAA on firefighting equipment and vehicles used for wildfire suppression.

Wildfire suppression includes staging firefighting vehicles and equipment, clearing fire lines, and applying other suppression techniques (retardant, back burns, etc.). Impacts on vegetation resources from suppression activities include removal of vegetation communities from surface disturbance at staging areas and fire lines. The area of surface disturbance from wildfire suppression activities is unknown, but the disturbance to vegetation communities is likely small relative to the combustion impacts of the wildfires.

Forest plantations – Forest plantations established within the CIAA in 1980 or later were considered in the cumulative effects analysis. Forest plantations planted prior to 1980 were not considered because these areas would function closer to native forest communities than plantations. Approximately 2,158 acres (3 percent) of the CIAA consists of forest plantations that were planted in 1980 or later. The largest forest plantation consists of approximately 1,738 acres and was established from planted and natural regeneration following the Crystal Wildfire in 1994. These plantations have been periodically thinned to reduce competition.

Impacts from forest plantations are associated with changes to the species composition and structure of vegetation communities and creating variation in the maturity stages of forest communities. Although trees within each contiguous plantation area are typically the same age, trees in other plantation areas and in forest communities surrounding the plantation are generally a different age. Several "natural" phenomena will continue to influence the development of the younger forest plantations within the CIAA, including: wildfire, wind, avalanche, landslides, drought, insects, disease, and competitive mortality.

Forest product resources have been impacted from forest plantations, particularly the plantations established in the 1980s. These plantations have had roughly 30 years to develop and trees have likely reached sizes suitable for firewood cutting.

Prescribed fire – Prescribed fire has impacted approximately 381 acres of vegetation communities within the CIAA. Impacts on vegetation communities from prescribed fire are associated with changes in species composition, structure, and succession stages, and changes in the behavior and effects of future wildfires. Within forest communities specifically, prescribed fire has had additional impacts associated with reducing tree density, reducing canopy bulk density, and raising the canopy base height. These impacts reduce tree mortality and wildfire torching and also reduce the probability for a wildfire to move into the crowns of trees.

Accordingly, the impacts from prescribed fire have been beneficial for forest communities. Because prescribed fires reduce tree mortality and the probability for a devastating wildfire, impacts on forest product resources have also been positive.

Mastication – Mastication (i.e., mowing) has impacted approximately 769 acres of vegetation communities within the CIAA. Impacts have been limited to shrub dominated communities and communities dominated by forbs and grasses. Impacts on vegetation communities from mastication are related to changes in species composition and structure, succession stages, and the behavior and effects of wildfire. Mastication impacts on vegetation resources are generally beneficial.

Timber sales – Timber sale impacts on vegetation resources are associated with changes to the species composition of vegetation communities and succession stages. Removal of timber also reduces fuel load and changes the behavior and effects of wildfire, and improves forest health, which indirectly impacts vegetation communities.

Approximately 3,811 acres of forest communities within the CIAA were included in timber sales during the 1990's decade (**Table 3-14**). The largest of these sales was the approximately 3,089-acre Crystal Fire timber salvage sale, which occurred on NFS land generally south of Dog Creek and west of Verdi. Approximately 2,756 acres of the Crystal Fire timber salvage sale area occurs within the CIAA. Other timber sales within the CIAA were located either in this same general area or in Dog Valley.

Firewood cutting - Firewood cutting has impacted approximately 195 acres of vegetation communities within the CIAA (**Table 3-14**). Impacts from firewood cutting on vegetation resources are generally beneficial because fuel loads are reduced, density is reduced, and forest health is improved. Reduced fuel loads lessen the probability for large devastating wildfires which otherwise kill existing vegetation cover.

3.4.3 Reasonably Foreseeable Actions

Reasonably foreseeable future actions are defined in 36 CFR Part 220.3 as: "*Those Federal or non-Federal activities not yet undertaken, for which there are existing decisions, funding, or identified proposals. Identified proposals for Forest Service actions are described in §220.4(a)(1).*"

Based on the above definition, the reasonably foreseeable future actions that have been considered for the cumulative effects analysis include continuation of the present actions within the CIAA, as well as the specific projects identified in **Table 3-15**. Where possible and appropriate, the surface disturbance impacts of the reasonably foreseeable future actions that are not continuation of present actions were measured using data obtained from the USFS or from interpretation of aerial imagery. The estimated surface disturbance for these reasonably

foreseeable future actions is also presented in **Table 3-15**. The estimated surface disturbance from continuation of present actions is listed in **Table 3-14**. Reasonably foreseeable future actions with no potential impacts on vegetation resources were not included in the cumulative effects analysis.

Table 3-15 Reasonably Foreseeable Future Actions in the CIAA

Project Lead Agency	General Location	Description	Estimated Disturbance (if available)
USFS	Dog Valley	Dog Valley Fuels Reduction and Ecosystem Enhancement Project	13,056 acres
USFS	Dog Valley	Collie Stewardship Sale	11.4 acres
USFS	Dog Valley	Green Personal Use Fuelwood Areas	20 acres (annually)
USFS	Mitchell Canyon	Personal use fuel wood cutting area. Project is approximately 80 percent complete, additional cutting and slash burning will continue through 2014.	60.2 acres
USFS	Peavine Mountain	Rehabilitation and/or restoration of approximately 3.5 miles of existing trails, rerouting of social trails, and approximately 3.1 miles of road-to-trail conversion and new single-track trail construction.	3.1 miles
USFS	Dog Valley	Designation of approximately 4.5 miles of spur roads for access to dispersed recreation opportunities, closure of some NFS roads without physical access, and reclamation of other NFS roads.	4.5 miles

3.4.4 Cumulative Effects of the No Action Alternative

Implementation of the No Action Alternative would not cause any increase in ground disturbing activities from the existing conditions within the CIAA. Vegetation communities within the CIAA would continue to be influenced by natural succession, wildfires, and other natural occurrences, such as drought or storm damage. Surface disturbance from reasonably foreseeable future actions may contribute to the continued spread of noxious weeds within the CIAA. The No Action Alternative would have no cumulative effects on vegetation resources.

3.4.5 Cumulative Effects of Action Alternatives

The incremental effect from construction of any action alternative, as described in **Sections 3.2.3** through **3.2.6,** would be very small because most of the vegetation communities that would be removed by any action alternative would be restored through reclamation after construction is complete. Impacts would be moderate within the first several years immediately following construction. However, as reclamation achieves success criteria and native vegetation cover is restored, the incremental effect would quickly decrease to negligible because only permanent removal would remain. Permanent loss of shrub- and grass-dominated vegetation communities

would range from 3.8 to 3.9 acres and would impact communities that are locally and regionally abundant. The long-term, permanent loss of forest vegetation communities within the transmission line clearance area and areas where existing roads were widened for construction access would impact as little as 4.1 acres or as much as 47.2 acres, depending on the action alternative. However, the forest vegetation communities that would be impacted are locally and regionally abundant. The contribution of any action alternative to cumulative losses of vegetation within the CIAA would be negligible.

The spread of noxious and invasive weeds within the CIAA would continue as infestations of noxious weeds are often extremely difficult to eradicate. Eradication typically requires all land owners and land management agencies to cooperate in accepted weed control measures. Implementation of a region-wide noxious weed eradication project is not reasonably foreseeable, and the spread of noxious and invasive weeds is expected to continue. On NFS land, infestations would likely be less severe because the Carson Ranger District has an active weed management program, where the weeds are identified, mapped and treated; and control of weeds would occur on a project by project basis. The cumulative effect on the spread of noxious and invasive weeds of any of the action alternatives would be negligible because design features would require treatment and monitoring of infestations.

The loss of suitable timber management areas within the CIAA by reasonably foreseeable future actions are not anticipated to result in any permanent loss. The cumulative effect on the loss of timber management areas by the Mitchell, Peavine, and Peavine/Poeville Alternative would be negligible because permanent losses from the alternatives represent a minimal percentage of the suitable timber management areas within the CIAA. The Poeville Alternative would contribute to no cumulative losses of suitable timber management area.

4.0 REFERENCES

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FIGURES

Bordertown Substation
Alturas Line
Silver Lake Substation
#141 Line
Peavine Peak
Poeville
CALIFORNIA
NEVADA
Summit One
#102 Line
Beacon Point
#101 Line
California Substation
Verdi
#106 Line
Somersett Community
#114 Line (Underground)
#114 Line
Northwest Substation
Reno
#142 Line
Mogul
Washoe Substation
North Valley Road Substation
#114 Line
#142 Line
Truckee River
Copyright © 2009 ESRI

Legend

Transmission Line Alternatives
- Mitchell
- Peavine
- Poeville
- Peavine/Poeville

Existing Features
- 120 kV Transmission Line
- Underground 120 kV Transmission Line
- 345 kV Transmission Line
- Substation
- USFS Roads
- USFS Trails

Land Ownership
- U.S. FOREST SERVICE
- PRIVATE LAND
- CALIFORNIA DEPT. OF FISH AND WILDLIFE
- U.S. BUREAU OF LAND MANAGEMENT
- U.S. DEPT. OF DEFENSE
- U.S. BUREAU OF RECLAMATION

Note: Segments of Transmission Line Alternatives that appear parallel share the same alignment. Transmission lines are offset for visual purposes only.

N

1" = 6,000 feet

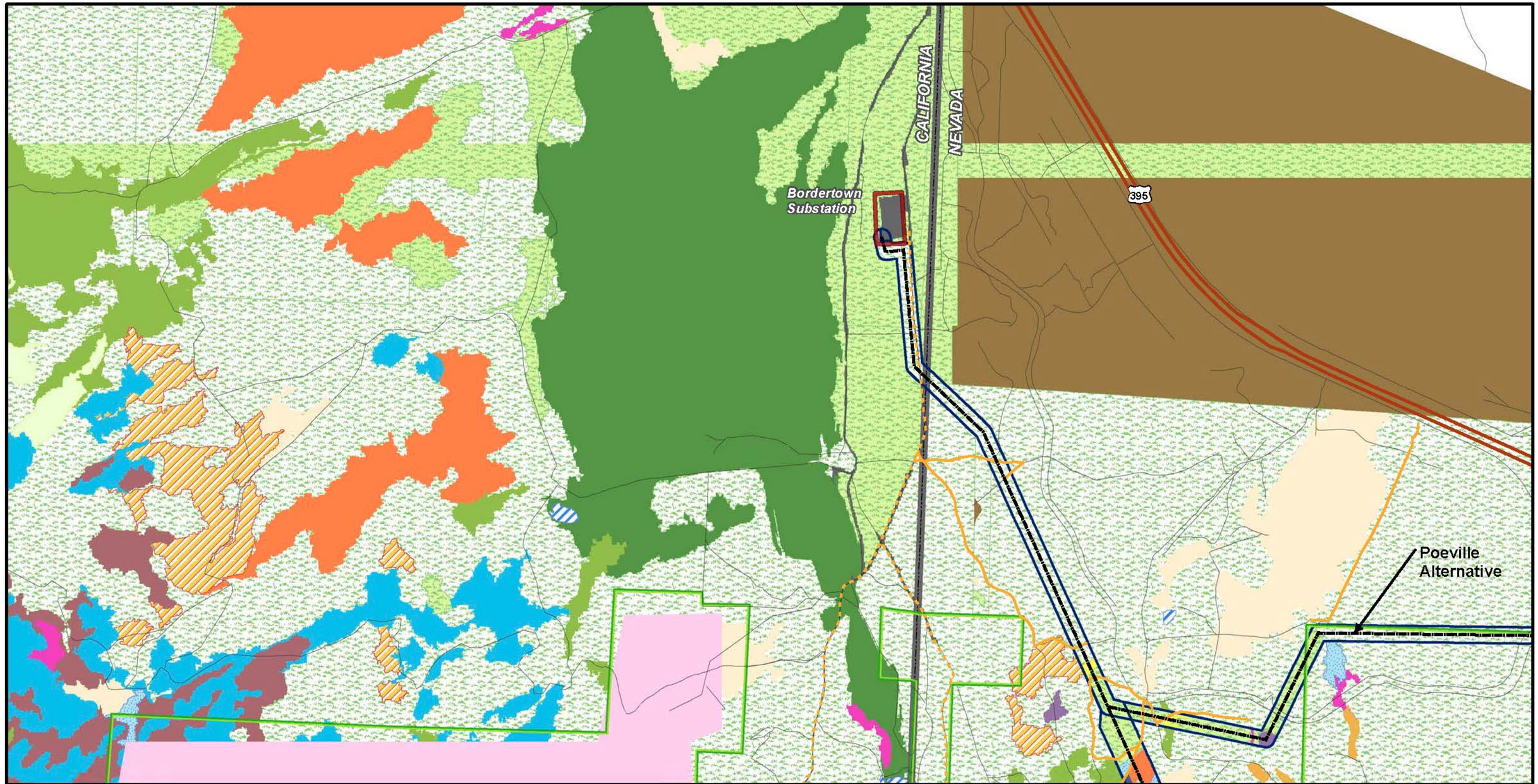
0 3,000 6,000 12,000 Feet

DATE DRAWN: 11/22/2013

SPECIALIST REPORT

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 1
OVERVIEW OF
ACTION ALTERNATIVES CONSIDERED

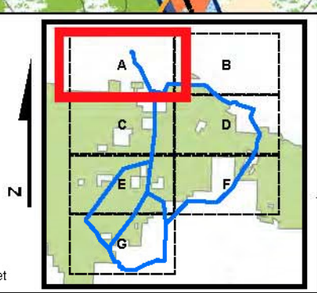


Existing Public and Private Roads to be Used (No Widening)
Public and Private Roads to be Widened Temporarily
Proposed Alternative
Variable Width Analysis Corridor
USFS Boundary

Mixed Conifer
Eastside Pine
Jeffrey Pine
Forest Planting
Aspen
Mahogany
Bitterbrush-sagebrush
Annual Grass
Chaparral
Mixed Scrub
Ruderal
Big Sagebrush
Mountain Sagebrush
Low Sagebrush
Snowbrush Alliance
Wet Meadow
Willow
Agriculture
Urban and Developed Land
Water

DATE DRAWN 9/19/2014

1 IN = 1,800 feet
1,800 900 0 1,800 Feet



SPECIALIST REPORT VEGETATION

BORDERTOWN TO CALIFORNIA 120 KV TRANSMISSION LINE PROJECT

FIGURE 2A
VEGETATION COMMUNITIES

Limits of Mapped
Vegetation Communities

Poeville
Alternative

395

Silver Lake Substation

Existing Public and Private Roads to be Used (No Widening)
Public and Private Roads to be Widened Temporarily
Proposed Alternative
Variable Width Analysis Corridor
USFS Boundary

Aspen
Mahogany
Bitterbrush-sagebrush
Annual Grass
Ruderal

Big Sagebrush
Wet Meadow
Willow
Urban and Developed Land

DATE DRAWN 9/19/2014

1 IN = 1,800 feet
1,800 900 0 1,800 Feet

N

A B C D E F G

SPECIALIST REPORT VEGETATION

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 2B
VEGETATION COMMUNITIES

CALIFORNIA

NEVADA

Existing Public and Private Roads to be Used (No Widening)
Public and Private Roads to be Widened Temporarily
Proposed Alternative
Variable Width Analysis Corridor
USFS Boundary

Mixed Conifer
Eastside Pine
Jeffrey Pine
Forest Planting
Aspen

Mahogany
Bitterbrush-sagebrush
Annual Grass
Chaparral
Mixed Scrub

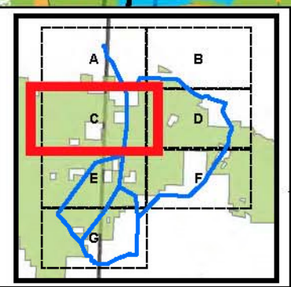
Big Sagebrush
Mountain Sagebrush
Low Sagebrush
Snowbrush Alliance
Wet Meadow

Willow
Agriculture
Urban and Developed Land
Water

DATE DRAWN 9/19/2014

1 IN = 1,800 feet

1,800 900 0 1,800 Feet



SPECIALIST REPORT VEGETATION

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 2C
VEGETATION COMMUNITIES

Limits of Mapped Vegetation Communities

395

Poeville Alternative

Existing Public and Private Roads to be Used (No Widening)
Public and Private Roads to be Widened Temporarily
Proposed Alternative
Variable Width Analysis Corridor
USFS Boundary

Mixed Conifer
Eastside Pine
Jeffrey Pine
Aspen
Mahogany
Bitterbrush-sagebrush
Annual Grass
Chaparral
Mixed Scrub
Ruderal
Big Sagebrush
Mountain Sagebrush
Low Sagebrush
Snowbrush Alliance
Wet Meadow
Willow
Urban and Developed Land

DATE DRAWN 9/19/2014

1 IN = 1,800 feet
1,800 900 0 1,800 Feet

N

A B C D E F G

SPECIALIST REPORT VEGETATION

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 2D
VEGETATION COMMUNITIES

CALIFORNIA

NEVADA

Mitchell Alternative

Peavine/Poeville Alternative

Peavine Alternative

- Existing Public and Private Roads to be Used (No Widening)
- Public and Private Roads to be Widened Temporarily
- Proposed Alternative
- Variable Width Analysis Corridor
- USFS Boundary

- Mixed Conifer
- Eastside Pine
- Jeffrey Pine
- Forest Planting
- Aspen
- Mahogany
- Bitterbrush-sagebrush
- Annual Grass
- Chaparral
- Mixed Scrub
- Big Sagebrush
- Low Sagebrush
- Snowbrush Alliance
- Wet Meadow
- Willow
- Urban and Developed Land
- Perennial Grasses and Forbs Alliance

DATE DRAWN 9/19/2014

1 IN = 1,800 feet

1,800 900 0 1,800 Feet

N

A B C D E F G

SPECIALIST REPORT VEGETATION

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 2E
VEGETATION COMMUNITIES

Limits of Mapped Vegetation Communities

Poeville Alternative

Existing Public and Private Roads to be Used (No Widening)
Public and Private Roads to be Widened Temporarily
Proposed Alternative
Variable Width Analysis Corridor
USFS Boundary

Mixed Conifer
Eastside Pine
Jeffrey Pine
Aspen
Mahogany
Bitterbrush-sagebrush

Annual Grass
Chaparral
Mixed Scrub
Ruderal
Big Sagebrush
Mountain Sagebrush

Low Sagebrush
Snowbrush Alliance
Wet Meadow
Willow
Urban and Developed Land

DATE DRAWN 9/19/2014

1 IN = 1,800 feet
1,800 900 0 1,800 Feet

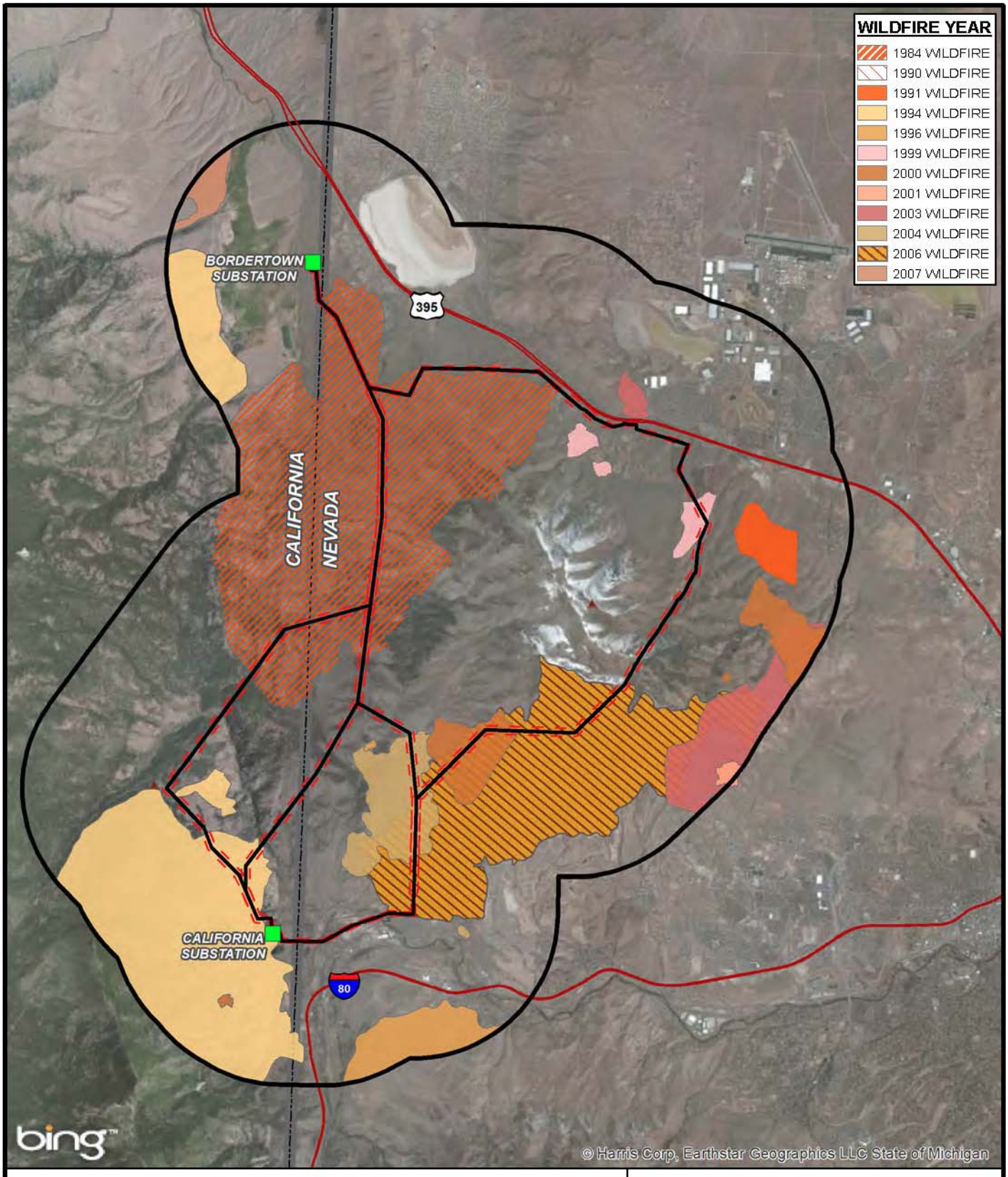
N

A B C D E F G

SPECIALIST REPORT
VEGETATION

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 2F
VEGETATION COMMUNITIES



Proposed Alignments
Analysis Area
Variable Width Analysis Corridor

N

1 inch = 10,000 feet

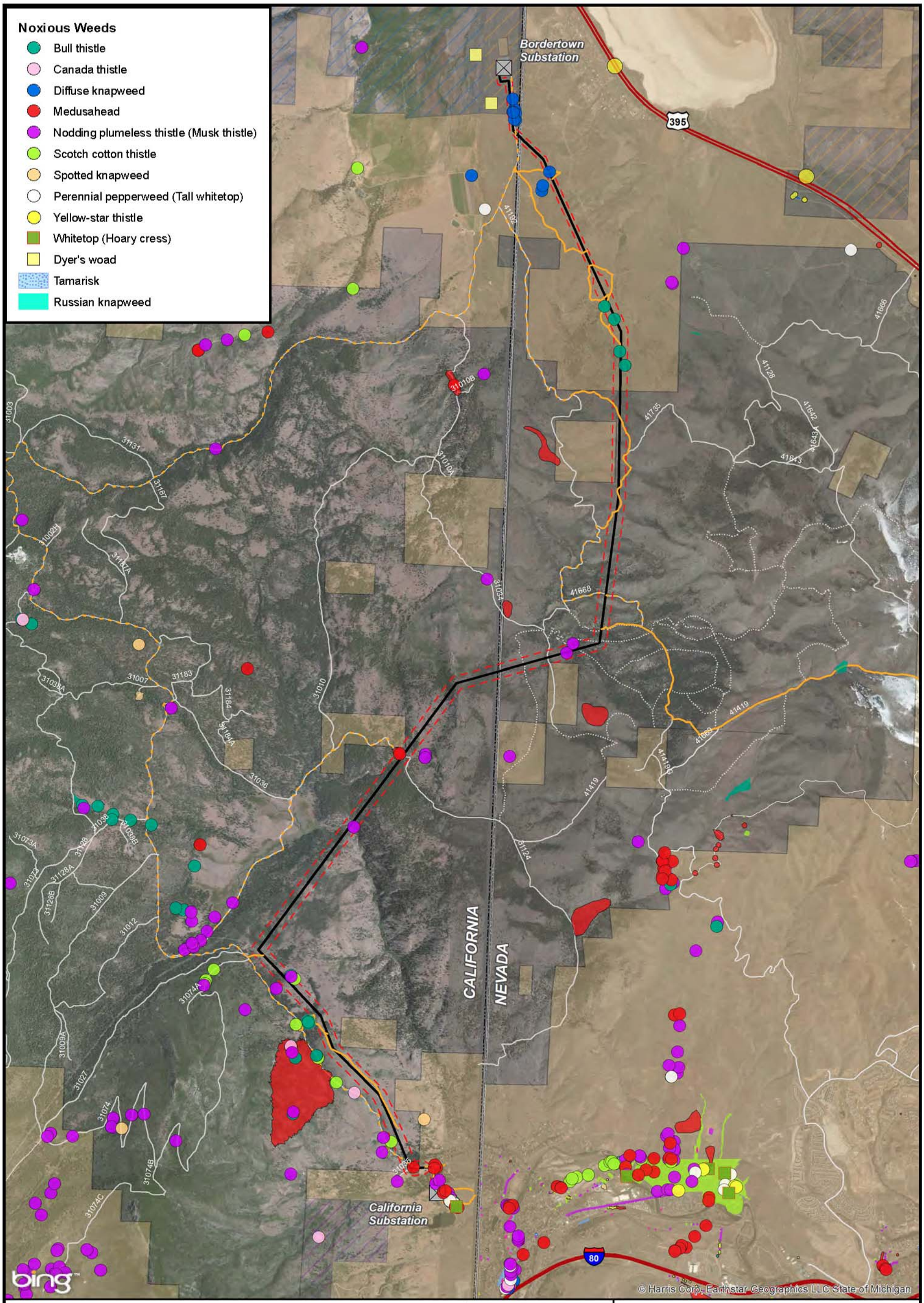
10,000 5,000 0 10,000 Feet

DATE DRAWN 12/19/2013

SPECIALIST REPORT VEGETATION RESOURCES

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 3
WILDFIRE LOCATIONS



SPECIALIST REPORT
VEGETATION RESOURCES

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 4
NOXIOUS WEEDS
MITCHELL ALTERNATIVE

Noxious Weeds

- Bull thistle
- Canada thistle
- Diffuse knapweed
- Medusahead
- Nodding plumeless thistle (Musk thistle)
- Scotch cotton thistle
- Spotted knapweed
- Perennial pepperweed (Tall whitetop)
- Yellow-star thistle
- Whitetop (Hoary cress)
- Dyer's woad
- Tamarisk
- Russian knapweed

Bordertown Substation

California Substation

CALIFORNIA

NEVADA

395

80

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Land Ownership

- U.S. FOREST SERVICE
- PRIVATE LAND
- CALIFORNIA DEPT. OF FISH AND WILDLIFE
- U.S. BUREAU OF LAND MANAGEMENT
- U.S. BUREAU OF RECLAMATION

- Proposed Alternative
- Variable Width Analysis Corridor
- Existing Public and Private Roads to be Used (No Widening)
- Public and Private Roads to be Widened Temporarily

1 inch = 4,000 feet

4,000 2,000 0 4,000 Feet

DATE DRAWN 12/4/2013

N

CAL NEVADA

SPECIALIST REPORT VEGETATION RESOURCES

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 5
NOXIOUS WEEDS
PEAVINE ALTERNATIVE

Bordertown Substation

California Substation

CALIFORNIA

NEVADA

395

80

41190

41666

41128

41642

41643A

41643

41735

41666A

41641

41645

41648

41668

41419

41419B

41669

41649

41462

31010B

31010

31035

bing

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Noxious Weeds

- Bull thistle
- Canada thistle
- Diffuse knapweed
- Medusahead
- Nodding plumeless thistle (Musk thistle)
- Scotch cotton thistle
- Spotted knapweed
- Perennial pepperweed (Tall whitetop)
- Yellow-star thistle
- Whitetop (Hoary cress)
- Barbed goatgrass
- Dyer's woad
- Tamarisk
- Russian knapweed

Land Ownership

- U.S. FOREST SERVICE
- PRIVATE LAND
- CALIFORNIA DEPT. OF FISH AND WILDLIFE
- U.S. BUREAU OF LAND MANAGEMENT
- U.S. DEPT. OF DEFENSE
- U.S. BUREAU OF RECLAMATION

DATE DRAWN 12/4/2013

- Proposed Alternative
- Variable Width Analysis Corridor
- Existing Public and Private Roads to be Used (No Widening)
- Public and Private Roads to be Widened Temporarily

1 inch = 4,000 feet

4,000 2,000 0 4,000 Feet

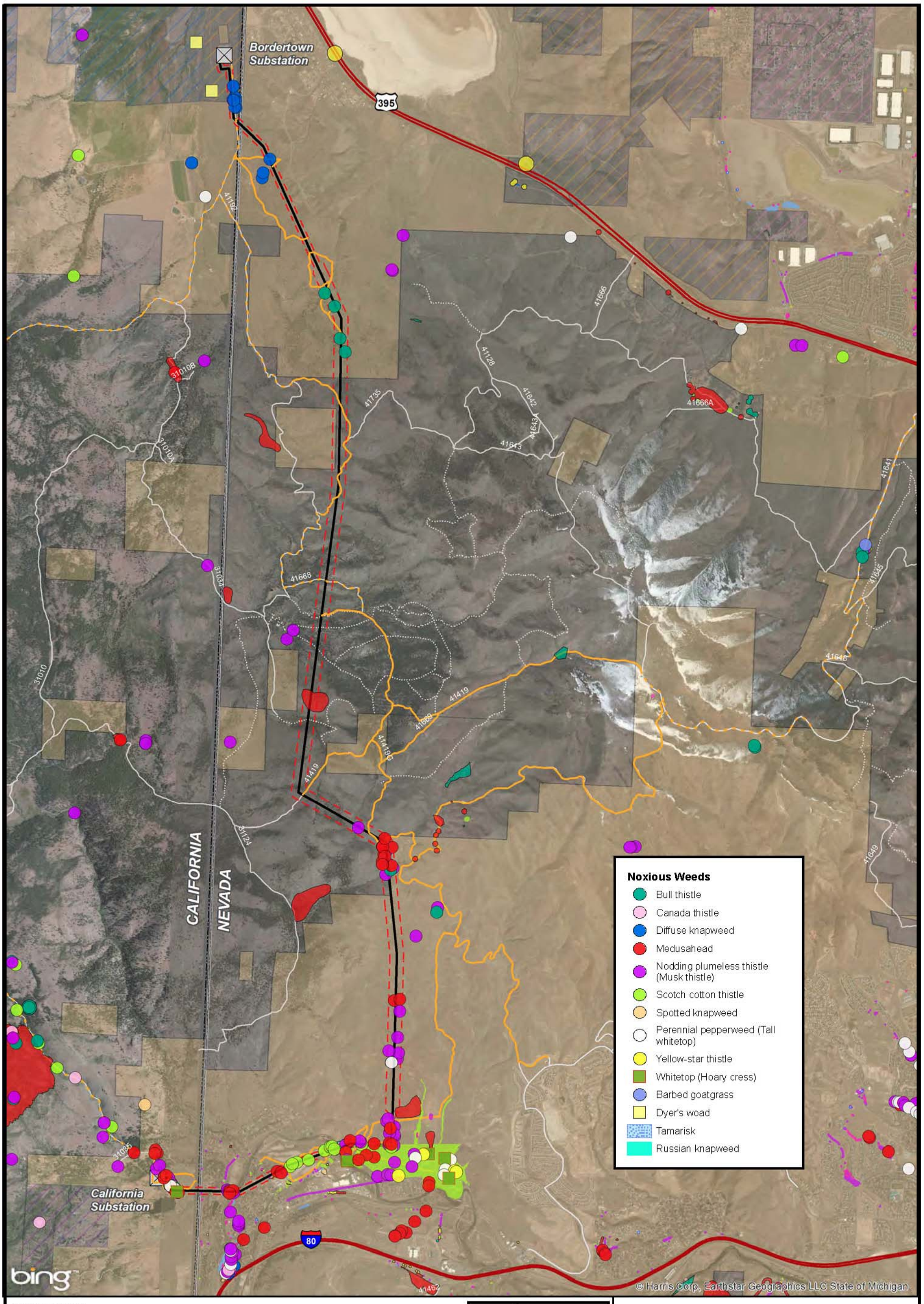
N

CAL NEVADA

SPECIALIST REPORT
VEGETATION RESOURCES

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

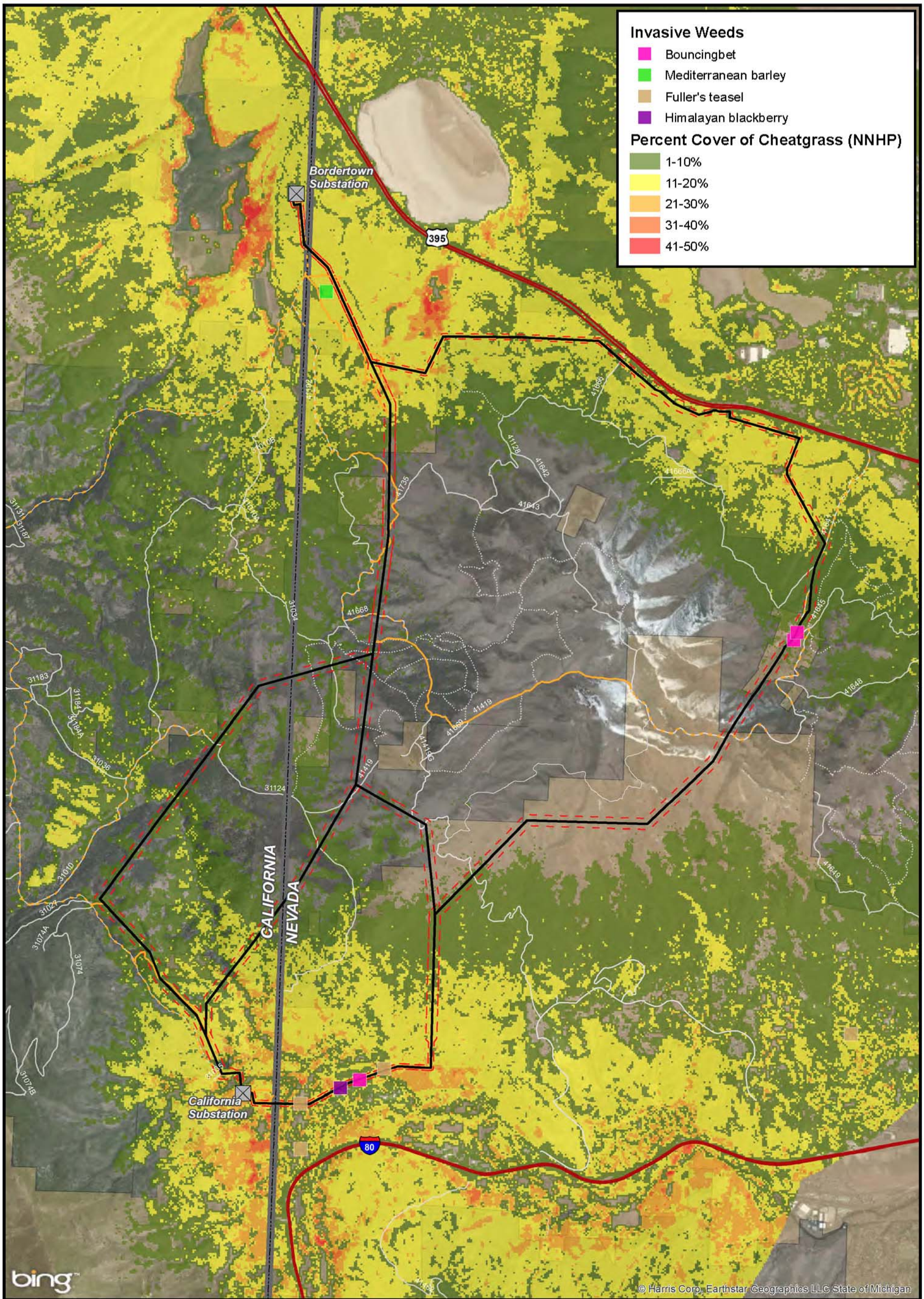
FIGURE 6
NOXIOUS WEEDS
POEVILLE ALTERNATIVE



SPECIALIST REPORT
VEGETATION RESOURCES

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 7
NOXIOUS WEEDS
PEAVINE/POEVILLE ALTERNATIVE



Land Ownership

- U.S. FOREST SERVICE
- PRIVATE LAND AND OTHER LAND

- Proposed Alignments
- Variable Width Analysis Corridor
- Existing Public and Private Roads to be Used (No Widening)
- Public and Private Roads to be Widened Temporarily

1 inch = 5,000 feet

5,000 2,500 0 5,000 Feet

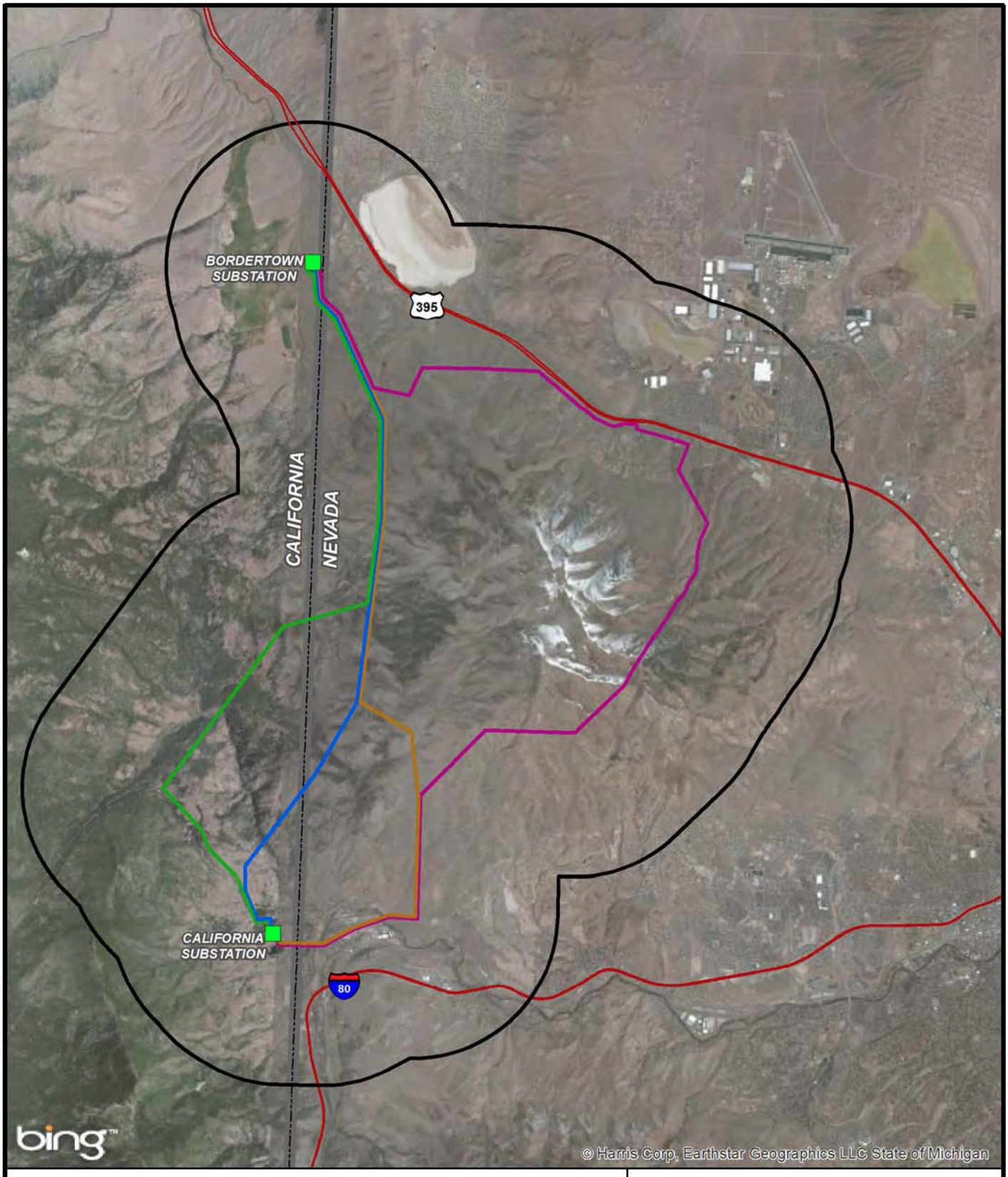
N

DATE DRAWN 12/19/2013

SPECIALIST REPORT
VEGETATION RESOURCES

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 8
INVASIVE SPECIES
ACTION ALTERNATIVES



Transmission Line Alternatives

- MITCHELL ALTERNATIVE
- PEAVINE ALTERNATIVE
- POEVILLE ALTERNATIVE
- PEAVINE/POEVILLE ALTERNATIVE

Cumulative Impacts Analysis Area

N

1 inch = 10,000 feet

10,000 5,000 0 10,000 Feet

DATE DRAWN 12/18/2013

SPECIALIST REPORT VEGETATION RESOURCES

BORDERTOWN TO CALIFORNIA
120 KV TRANSMISSION LINE PROJECT

FIGURE 9
CUMULATIVE IMPACTS ANALYSIS AREA

APPENDIX A

California and Nevada Noxious Weeds Lists

Introduced, Invasive, and Noxious Plants

NRCS Invasive Species Policy
Invasive Species Executive Order 13112

California State-listed Noxious Weeds

251 records returned

Click on an accepted name below to view its PLANTS Profile with more information, and web links if available. Noxious weeds that are synonyms retain their noxious status, and are indented beneath the current PLANTS accepted name.

California Department of Food and Agriculture. 2003. *Pest ratings of noxious weed species and noxious weed seed* (20 October 2003). California Department of Food and Agriculture.

California Department of Food and Agriculture. 2003. *Plant quarantine manual, California plant quarantine policy - weeds* (20 October 2003). California Department of Food and Agriculture.

Food and Agriculture Code. 2003. *Camelthorn, Section 7301-7305* (20 October 2003). State of California.

Food and Agriculture Code. 2003. *Hydrilla, Section 6048-6049* (20 October 2003). State of California.

Symbol	Scientific Name	Noxious Common Name	State Noxious Status†	Native Status*
ACPA8	*Acacia paradoxa* DC.	kangaroothorn	BW	L48 (I)
ACNO7	*Acaena novae-zelandiae* Kirk			L48 (I)
ACNO4	*Acaena novae-zelandica* Kirk, orth. var.	biddy biddy	AW	
ACPA14	*Acaena pallida* (Kirk) Allen	pale biddy-biddy	AW	L48 (I)
ACBR5	*Achnatherum brachychaetum* (Godr.) Barkworth	punagrass	AW	L48 (I)
ACRE3	*Acroptilon repens* (L.) DC.	Russian knapweed	BW	L48 (I), CAN (I)
AECY	*Aegilops cylindrica* Host	jointed goatgrass	BW	L48 (I)
AEGE	*Aegilops geniculata* Roth			L48 (I)
AEOV2	*Aegilops ovata* L. p.p.	ovate goatgrass	BW	
AETR	*Aegilops triuncialis* L.	barb goatgrass	BW	L48 (I)
AEGIN	*Aeginetia* L.		Q	
AERU	*Aeschynomene rudis* Benth.	rough jointvetch	BW	L48 (N), PR (N)
AGAD2	*Ageratina adenophora* (Spreng.) King & H. Rob.	crofton weed	Q	L48 (I), HI (I)
ALECT2	*Alectra* Thunb.		Q	
ALMA12	*Alhagi maurorum* Medik.	camelthorn	AW, PN	L48 (I)
ALNE3	*Allium neapolitanum* Cirillo			
NOIN3	*Nothoscordum inodorum* (Aiton) G. Nicholson	false garlic	BW	
ALPA20	*Allium paniculatum* L.	panicled onion	BW	L48 (I)
ALVI	*Allium vineale* L.	wild garlic	BW	L48 (I), AK (I), CAN (I)
ALPH	*Alternanthera philoxeroides* (Mart.) Griseb.	alligatorweed	AW	L48 (I), PR (I)
ALSE4	*Alternanthera sessilis* (L.) R. Br. ex DC.	sessile joyweed	Q	L48 (I), HI (I), PR (N), VI (N)
AMTR	*Ambrosia trifida* L.	giant ragweed	BW	L48 (N), CAN (N)
ARSE8	*Araujia sericifera* Brot.	bladderflower	BW	L48 (I)
ARCA45	*Arctotheca calendula* (L.) Levyns	capeweed	AW	L48 (I)
ASFI2	*Asphodelus fistulosus* L.	onionweed	Q	L48 (I)
AVST	*Avena sterilis* L.	animated oat	Q	L48 (I), CAN (W)
AZPI	*Azolla pinnata* R. Br.	mosquito fern	Q	L48 (I)
CACA	*Cabomba caroliniana* A. Gray	Carolina fanwort	QW	L48 (N), CAN (N)
CACH42	*Cardaria chalepensis* (L.) Hand.-Maz.			L48 (I), CAN (I)
CACH10	*Cardaria chalapensis* (L.) Hand.-Maz., orth. var.	lens podded hoarycress	BW	
CADR	*Cardaria draba* (L.) Desv.	lens podded hoarycress	BW	L48 (I), CAN (I)
CAPU6	*Cardaria pubescens* (C.A. Mey.) Jarmolenko	lens podded hoarycress	BW	L48 (I), CAN (I)
CAAC	*Carduus acanthoides* L.	plumeless thistle	AW	L48 (I), CAN (I)
CANU4	*Carduus nutans* L.	musk thistle	AW	L48 (I), CAN (I)
CAPY2	*Carduus pycnocephalus* L.	Italian thistle	CW	L48 (I), HI (I)
CATE2	*Carduus tenuiflorus* W. Curtis	slenderflowered thistle	CW	L48 (I)
CALA20	*Carthamus lanatus* L.	woolly distaff thistle	BW	L48 (I), CAN (I)
CALAC3	*Carthamus lanatus* L. ssp. *creticus* (L.) Holmboe			L48 (I), CAN (I)
CABA5	*Carthamus baeticus* (Boiss. & Reut.) Nyman	smooth distaff thistle	BW	
CALE52	*Carthamus leucocaulos* Sm.	whitestem distaff thistle	AW	L48 (I)
CAOX6	*Carthamus oxyacanthus* M. Bieb.			L48 (I)
CAOX2	*Carthamus oxyacantha* M. Bieb., orth. var.	wild safflower	Q	
CEEC	*Cenchrus echinatus* L.	southern sandbur	CW	L48 (N), HI (I), PR (N), VI (N)
CELO3	*Cenchrus longispinus* (Hack.) Fernald	mat sandbur	CW	L48 (N), CAN (N)
CESP4	*Cenchrus spinifex* Cav.			L48 (N), PR (N), VI (N)
CEIN4	*Cenchrus incertus* M.A. Curtis	coast sandbur	CW	
CECA2	*Centaurea calcitrapa* L.	purple starthistle	BW	L48 (I), CAN (I)
CEDI3	*Centaurea diffusa* Lam.	diffuse knapweed	AW	L48 (I), CAN (I)
CEIB	*Centaurea iberica* Trevir. ex Spreng.	Iberian starthistle	AW	L48 (I)
CESO3	*Centaurea solstitialis* L.	yellow starthistle	CW	L48 (I), CAN (I)
CESTM	*Centaurea stoebe* L. ssp. *micranthos* (Gugler) Hayek			L48 (I), HI (I), CAN (I)
CEMA4	*Centaurea maculosa* auct. non Lam.	knapweed	AW	
CESU	*Centaurea sulphurea* Willd.	Sicilian starthistle	BW	L48 (I)
CEVIS2	*Centaurea virgata* Lam. ssp. *squarrosa* (Willd.) Gugler			L48 (I)
CESQ	*Centaurea squarrosa* Willd.	squarrose knapweed	AW	
CHJU	*Chondrilla juncea* L.	skeletonweed	AW	L48 (I), CAN (I)
CHTE2	*Chorispora tenella* (Pall.) DC.	purple mustard	BW	L48 (I), CAN (W)
CHAC	*Chrysopogon aciculatus* (Retz.) Trin.	pilipiliula	Q	HI (I)

CIAR4	*Cirsium arvense* (L.) Scop.	Canada thistle	BW	L48 (I), AK (I), CAN (I), GL (I), SPM (I)
CIJA2	*Cirsium japonicum* Fisch. ex DC.	Japanese thistle	QW	
CIOC2	*Cirsium ochrocentrum* A. Gray	yellowspine thistle	AW	L48 (N)
CIUN	*Cirsium undulatum* (Nutt.) Spreng.	wavyleaf thistle	AW	L48 (N), CAN (N)
COBE2	*Commelina benghalensis* L.	Benghal dayflower	Q	L48 (I), HI (I), PR (I)
COAR4	*Convolvulus arvensis* L.	field bindweed	CW	L48 (I), HI (I), CAN (I)
COSQ	*Coronopus squamatus* (Forssk.) Asch.	swinecress	BW	L48 (I), CAN (I)
CRVU2	*Crupina vulgaris* Cass.	bearded creeper, common crupina	AW, Q	L48 (I)
CUME	*Cucumis melo* L.			L48 (I), PR (I), CAN (W)
CUMED	*Cucumis melo* L. var. *dudaim* (L.) Naud.	dudaim melon	AW	
CUMY	*Cucumis myriocarpus* E. Mey. ex Naud.	paddy melon	BW	L48 (I)
CUSCU	*Cuscuta* L.[1]	dodder	CW, Q	
CURE	*Cuscuta reflexa* Roxb.	giant dodder	AW	L48 (I)
CYCA	*Cynara cardunculus* L.	artichoke thistle	BW	L48 (I)
CYNOD	*Cynodon* Rich.	bermudagrass	CW	
CYES	*Cyperus esculentus* L.	yellow nutsedge	BW	L48 (NI), HI (I), PR (I), VI (I), CAN (I)
CYRO	*Cyperus rotundus* L.	purple nutsedge	BW	L48 (I), HI (I), PR (I), VI (I)
CYSC4	*Cytisus scoparius* (L.) Link	Scotch broom	CW	L48 (I), AK (I), HI (I), CAN (I)
DIAB	*Digitaria abyssinica* (Hochst. ex A. Rich.) Stapf			HI (I)
DISC5	*Digitaria scalarum* (Schweinf.) Chiov.	African couch grass	Q	
DIVE2	*Digitaria velutina* (Forssk.) P. Beauv.	velvet fingergrass	Q	L48 (I)
DRAR7	*Drymaria arenarioides* Humb. & Bonpl. ex Schult. [excluded]	alfombrilla	Q	
EIAZ2	*Eichhornia azurea* (Sw.) Kunth	anchored waterhyacinth	Q	L48 (I), PR (I)
EICR	*Eichhornia crassipes* (Mart.) Solms	waterhyacinth	CW	L48 (I), HI (I), PR (I), VI (I), CAN (W)
ELRE4	*Elymus repens* (L.) Gould			L48 (I), AK (I), CAN (I), GL (I), SPM (I)
ELRE3	*Elytrigia repens* (L.) Desv. ex Nevski	quackgrass	BW	
EMAU	*Emex australis* Steinh.	three-cornered jack	Q	L48 (I)
EMSP	*Emex spinosa* (L.) Campd.	devil's thorn	Q	L48 (I), HI (I)
EUES	*Euphorbia esula* L.	leafy spurge	AW	L48 (I), CAN (I)
EUOB4	*Euphorbia oblongata* Griseb.	oblong spurge	BW	L48 (I)
EUSE12	*Euphorbia serrata* L.	serrate spurge	AW	L48 (I)
EUTE10	*Euphorbia terracina* L.	Geraldton carnation spurge	QW	L48 (I)
GAOF	*Galega officinalis* L.	goatsrue	Q	L48 (I), CAN (I)
GACO5	*Gaura coccinea* Nutt. ex Pursh	scarlet gaura	BW	L48 (N), CAN (N)
GADR	*Gaura drummondii* (Spach) Torr. & A. Gray	Drummond's gaura	BW	L48 (N)
GASI	*Gaura sinuata* Nutt. ex Ser.	wavy-leaved gaura	BW	L48 (N)
GEMO2	*Genista monspessulana* (L.) L.A.S. Johnson	French broom	CW	L48 (I)
GYPA	*Gypsophila paniculata* L.	baby's breath	BW	L48 (I), CAN (I)
HAHA8	*Halimodendron halodendron* (Pall.) Voss	Russian salt tree	AW	L48 (I), CAN (I)
HAGL	*Halogeton glomeratus* (M. Bieb.) C.A. Mey.	halogeton	AW	L48 (I)
HECI	*Helianthus ciliaris* DC.	blueweed	AW	L48 (N)
HEMA17	*Heracleum mantegazzianum* Sommier & Levier	giant hogweed	Q	L48 (I), CAN (I)
HECO10	*Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schult.	tanglehead	AW	L48 (N), HI (N), PR (N), VI (N)
HYVE3	*Hydrilla verticillata* (L. f.) Royle	hydrilla	AW, NAW, Q	L48 (I)
HYMO6	*Hydrocharis morsus-ranae* L.	frogbit	AW	L48 (I), CAN (I)
HYPO3	*Hygrophila polysperma* (Roxb.) T. Anderson	Miramar weed	Q	L48 (I)
HYNI	*Hyoscyamus niger* L.	black henbane	CW	L48 (I), CAN (I)
HYPE	*Hypericum perforatum* L.	klamathweed	CW	L48 (I), HI (I), CAN (I), SPM (I)
IMBR	*Imperata brasiliensis* Trin.	Brazilian satintail	Q	L48 (I), PR (I)
IMBR2	*Imperata brevifolia* Vasey	satintail	BW	L48 (N)
IMCY	*Imperata cylindrica* (L.) P. Beauv.	cogongrass	Q	L48 (I)
IPAQ	*Ipomoea aquatica* Forssk.	Chinese waterspinach	Q	L48 (I), HI (I), PR (I)
IRDO	*Iris douglasiana* Herb.	Douglas iris	CW	L48 (N)
IRMI	*Iris missouriensis* Nutt.	western blue flag	CW	L48 (N), CAN (N)
ISTI	*Isatis tinctoria* L.	dyer's woad	BW	L48 (I), CAN (W)
ISRU	*Ischaemum rugosum* Salisb.	murain-grass	Q	L48 (I)
IVAX	*Iva axillaris* Pursh	povertyweed	CW	L48 (N), CAN (N)
LAMA15	*Lagarosiphon major* (Ridley) Moss	oxygen weed	Q	
LELA2	*Lepidium latifolium* L.	perennial peppercress	BW	L48 (I), CAN (I)
LECH2	*Leptochloa chinensis* (L.) Nees [excluded]	Asian sprangletop	Q	
LISP2	*Limnobium spongia* (Bosc) Rich. ex Steud.	spongeplant	QW	L48 (N)
LIIN5	*Limnophila indica* (L.) Druce	ambulia	QW	L48 (I)
LISE3	*Limnophila sessiliflora* (Vahl) Blume	ambulia	Q	L48 (I)
LIDAD	*Linaria dalmatica* (L.) Mill. ssp. *dalmatica*			L48 (I), CAN (I)
LIGED	*Linaria genistifolia* (L.) Mill. ssp. *dalmatica* (L.) Maire & Petitm.	Dalmatian toadflax	AW	
LYFE4	*Lycium ferocissimum* Miers			L48 (I)
LYFE3	*Lycium ferrocissimum* Miers, orth. var.	African boxthorn	Q	
LYSA2	*Lythrum salicaria* L.	purple loosestrife	BW	L48 (I), CAN (I), SPM (I)
MALE3	*Malvella leprosa* (Ortega) Krapov.	alkali mallow	CW	L48 (N)
MEQU	*Melaleuca quinquenervia* (Cav.) S.F. Blake	melaleuca	Q	L48 (I), HI (I), PR (I)
MEMA	*Melastoma malabathricum* L.		Q	HI (I)
MICO16	*Mikania cordata* (Burm. f.) B.L. Rob. [excluded]	mile-a-minute	Q	
MIMI5	*Mikania micrantha* Kunth	mile-a-minute	Q	L48 (I), PR (N)
MIDI8	*Mimosa diplotricha* C. Wright			HI (I), PR (I)
MIIN80	*Mimosa invisa* Mart., non Mart. ex Colla	giant sensitive plant	Q	
MIPE2	*Mimosa pellita* Kunth ex Willd.			L48 (N), PR (N)
MIPI	*Mimosa pigra* auct. non L.	catclaw mimosa	Q	

MOHA2	*Monochoria hastata* (L.) Solms [excluded]	monochoria	Q	
MOVA	*Monochoria vaginalis* (Burm. f.) C. Presl ex Kunth	pickerel weed	Q	L48 (I), HI (I)
MORAE	*Moraea* Mill.			
HOMER	*Homeria* Vent.	Cape tulip	Q	
MOCO8	*Moraea collina* Thunb.			L48 (I)
HOCO6	*Homeria collina* (Thunb.) Salisb.	Cape tulip	Q	
MOFL2	*Moraea flaccida* (Sweet) Steud.			
HOFL4	*Homeria flaccida* Sweet	Cape tulip	Q	
MOOC2	*Moraea ochroleuca* (Salisb.) Drapiez			
HOOC	*Homeria ochroleuca* Salisb.	Cape tulip	Q	
MOPA8	*Moraea pallida* (Baker) Goldblatt			
HOPA11	*Homeria pallida* Baker	Cape tulip	Q	
MUSC	*Muhlenbergia schreberi* J.F. Gmel.	nimblewill	BW	L48 (N), CAN (N)
NATR3	*Nassella trichotoma* (Nees) Hack.	serrated tussock	Q	L48 (I)
NYME	*Nymphaea mexicana* Zucc.	banana waterlily	BW	L48 (N), CAN (I)
ONAL5	*Ononis alopecuroides* L.	foxtail restharrow	QW	L48 (I)
ONAC	*Onopordum acanthium* L.	Scotch thistle	AW	L48 (I), CAN (W)
ONIL	*Onopordum illyricum* L.	Illyrian thistle	AW	L48 (I)
ONTA	*Onopordum tauricum* Willd.	Taurian thistle	AW	L48 (I)
OPAU10	*Opuntia aurantiaca* Lindl.	jointed prickly pear	Q	
OROBA	*Orobanche* L.[1]	broomrape	Q	
ORCO4	*Orobanche cooperi* (A. Gray) A. Heller	Cooper's broomrape	AW	L48 (N)
ORRA	*Orobanche ramosa* L.	branched broomrape	AW	L48 (I)
ORLO3	*Oryza longistaminata* A. Chev. & Roehr.	red rice	Q	
ORPU13	*Oryza punctata* Kotzchy ex Steud.	red rice	Q	
ORRU	*Oryza rufipogon* Griffiths	perennial wild red rice, red rice	BW, Q	L48 (I)
OTAL	*Ottelia alismoides* (L.) Pers.	duck-lettuce	Q	L48 (I)
PAAN4	*Panicum antidotale* Retz.	blue panicgrass	BW	L48 (I), HI (I)
PASC6	*Paspalum scrobiculatum* L.	Kodo-millet	Q	L48 (I), HI (I)
PEHA	*Peganum harmala* L.	harmel	AW	L48 (I)
PECL2	*Pennisetum clandestinum* Hochst. ex Chiov.	kikuyugrass	CW, Q	L48 (I), HI (I), PR (I), VI (I)
PEMA80	*Pennisetum macrourum* Trin.	African feathergrass	Q	L48 (I), HI (I)
PEPE24	*Pennisetum pedicellatum* Trin.	kyasuma-grass	Q	L48 (I)
PEPO14	*Pennisetum polystachion* (L.) Schult.			L48 (I), HI (I), PR (I)
PEPO4	*Pennisetum polystachyon* (L.) Schult., orth. var.	missiongrass	Q	
PHLO4	*Physalis longifolia* Nutt.	long-leaf groundcherry	AW	L48 (N), CAN (N)
PHVI17	*Physalis viscosa* L.	grape groundcherry	BW	L48 (N)
PIST2	*Pistia stratiotes* L.	water lettuce	BW	L48 (N), HI (I), PR (N), VI (N)
POAME	*Polygonum amphibium* L. var. *emersum* Michx.	kelp	CW	L48 (N), CAN (N)
POCU6	*Polygonum cuspidatum* Siebold & Zucc.	Japanese knotweed	BW	L48 (I), AK (I), CAN (I), SPM (I)
POPO5	*Polygonum polystachyum* Wall. ex Meisn.	Himalayan knotweed	BW	L48 (I), CAN (I), SPM (I)
POSA4	*Polygonum sachalinense* F. Schmidt ex Maxim.	giant knotweed	BW	L48 (I), AK (I), CAN (I)
PRAL11	*Prosopis alpataco* Phil.	mesquite	Q	
PRAR6	*Prosopis argentina* Burkart	mesquite	Q	
PRBU2	*Prosopis burkartii* Muñoz	mesquite	Q	
PRCA9	*Prosopis caldenia* Burkart	mesquite	Q	
PRCA10	*Prosopis calingastana* Burkart	mesquite	Q	
PRCA11	*Prosopis campestris* Griseb.	mesquite	Q	
PRCA12	*Prosopis castellanosii* Burkart	mesquite	Q	
PRDE4	*Prosopis denudans* Benth.	mesquite	Q	
PREL5	*Prosopis elata* (Burkart) Burkart	mesquite	Q	
PRFA2	*Prosopis farcta* (Banks & Sol.) J.F. Macbr.	Syrian mesquite	Q	L48 (I)
PRFE2	*Prosopis ferox* Griseb.	mesquite	Q	
PRFI4	*Prosopis fiebrigii* Harms	mesquite	Q	
PRHA4	*Prosopis hassleri* Harms ex Hassler	mesquite	Q	
PRHU3	*Prosopis humilis* Gillies ex Hook. & Arn.	mesquite	Q	
PRKU2	*Prosopis kuntzei* Harms ex Hassler	mesquite	Q	
PRPA4	*Prosopis pallida* (Humb. & Bonpl. ex Willd.) Kunth	kiawe	Q	HI (I), PR (I), VI (I)
PRPA10	*Prosopis palmeri* S. Watson	mesquite	Q	
PRRE2	*Prosopis reptans* Benth.	tornillo	Q	L48 (N)
PRRO4	*Prosopis rojasiana* Burkart	mesquite	Q	
PRRU4	*Prosopis ruizlealii* Burkart	mesquite	Q	
PRRU5	*Prosopis ruscifolia* Griseb.	mesquite	Q	
PRSE5	*Prosopis sericantha* Gillies ex Hook. & Arn.	mesquite	Q	
PRST3	*Prosopis strombulifera* (Lam.) Benth.	Argentine screwbean, creeping mesquite	AW, Q	L48 (I)
PRTO3	*Prosopis torquata* DC.	mesquite	Q	
PRVE	*Prosopis velutina* Woot.			L48 (N), HI (I)
PRAR4	*Prosopis articulata* S. Watson	velvet mesquite	Q	
ROAU	*Rorippa austriaca* (Crantz) Besser	Austrian field cress	BW	L48 (I), CAN (I)
ROSY	*Rorippa sylvestris* (L.) Besser	creeping yellow field cress	QW	L48 (I), AK (I), CAN (I), GL (I)
ROCO6	*Rottboellia cochinchinensis* (Lour.) W.D. Clayton	itchgrass	Q	L48 (I), PR (I)
RUFR80	*Rubus fruticosus* L. [excluded]	wild blackberry complex	Q	
RUMO4	*Rubus moluccanus* L. [excluded]	wild blackberry	Q	
SASP	*Saccharum spontaneum* L.	wild sugarcane	Q	HI (I), PR (I)
SASA7	*Sagittaria sagittifolia* L. [excluded]	arrowhead	Q	
SACO8	*Salsola collina* Pall.	spineless Russianthistle	QW	L48 (I), CAN (I)
SAPA8	*Salsola paulsenii* Litv.	barbwire Russianthistle	CW	L48 (I)
SATR12	*Salsola tragus* L.	common Russianthistle	CW	L48 (I), HI (I), CAN (I)
SAVE6	*Salsola vermiculata* L.	wormleaf salsola, wormleaf saltwort	AW, Q	L48 (I)
SAAE	*Salvia aethiopis* L.	Mediterranean sage	BW	L48 (I)

SAVI18	*Salvia virgata* Jacq.	southern meadow sage	AW	L48 (I)
SAAU	*Salvinia auriculata* Aubl.	giant salvinia, salvinia	Q, QW	PR (I)
SABI9	*Salvinia biloba* Raddi	giant salvinia	Q	
SAHE7	*Salvinia herzogii* de la Sota	giant salvinia	Q	
SAMO5	*Salvinia molesta* Mitchell	giant salvinia	Q	L48 (I), HI (I)
SCHI	*Scolymus hispanicus* L.	golden thistle	AW	L48 (I)
SEJA	*Senecio jacobaea* L.	tansy ragwort	BW	L48 (I), CAN (I), SPM (I)
SESQ	*Senecio squalidus* L.	Oxford ragwort	BW	L48 (I), CAN (N)
SEFA	*Setaria faberi* Herrm.	giant foxtail	BW	L48 (I), CAN (I)
SEPUP3	*Setaria pumila* (Poir.) Roem. & Schult. ssp. *pallidefusca* (Schumach.) B.K. Simon			L48 (I)
SEPA82	*Setaria pallidifusca* (Schumach.) Stapf & C.E. Hubbard, orth. var.	cattail grass	Q	
SOCA19	*Solanum cardiophyllum* Lindl.	heartleaf nightshade	AW	L48 (I)
SOCA3	*Solanum carolinense* L.	Carolina horsenettle	BW	L48 (N), CAN (I)
SODI	*Solanum dimidiatum* Raf.	Torrey's nightshade	AW	L48 (N)
SOEL	*Solanum elaeagnifolium* Cav.	white horsenettle	BW	L48 (N), HI (I), PR (N)
SOLA	*Solanum lanceolatum* Cav.	lanceleaf nightshade	BW	L48 (I)
SOMA	*Solanum marginatum* L. f.	white-margined nightshade	BW	L48 (I)
SOTA3	*Solanum tampicense* Dunal	wetland nightshade	Q	L48 (I)
SOTO4	*Solanum torvum* Sw.	turkeyberry	Q	L48 (I), HI (I), PR (I), VI (I)
SOVI2	*Solanum viarum* Dunal	tropical soda apple	Q	L48 (I)
SOAR2	*Sonchus arvensis* L.	perennial sowthistle	AW	L48 (I), AK (I), CAN (I), SPM (I)
SOHA	*Sorghum halepense* (L.) Pers.	johnsongrass	CW	L48 (I), HI (I), PR (I), CAN (I)
SPER	*Sparganium erectum* L.	exotic bur-reed	Q	L48 (N)
SPAL3	*Spermacoce alata* Aubl. [excluded]	borreria	Q	
SPSA3	*Sphaerophysa salsula* (Pall.) DC.	Austrian peaweed	AW	L48 (I), CAN (I)
STRIG	*Striga* Lour.	witchweed	Q	
STAS2	*Striga asiatica* (L.) Kuntze	witchweed	AW	L48 (I)
SYAS	*Symphytum asperum* Lepechin	rough comfrey	BW	L48 (I), AK (I), CAN (I)
TACA8	*Taeniatherum caput-medusae* (L.) Nevski	medusahead	CW	L48 (I)
TAMI3	*Tagetes minuta* L.	wild marigold	AW	L48 (I), HI (I), CAN (I)
TRTE	*Tribulus terrestris* L.	punctureveine	CW	L48 (I), HI (I), CAN (W)
TRPR5	*Tridax procumbens* L.	coat buttons	Q	L48 (I), HI (I), PR (I), VI (I)
ULEU	*Ulex europaeus* L.	gorse	BW	L48 (I), HI (I), CAN (I)
URPA	*Urochloa panicoides* P. Beauv.	liverseed grass	Q	L48 (I)
VIAL2	*Viscum album* L.	European mistletoe	BW	L48 (I)
ZYFA	*Zygophyllum fabago* L.	Syrian beancaper	AW	L48 (I)

†Code	Noxious Status
AW	A list (noxious weeds)
BW	B list (noxious weeds)
CW	C list (noxious weeds)
NAW	Noxious aquatic weed
PN	Public nuisance
Q	Quarantine
QW	Q list (temporary "A" list noxious weed, pending final determination)

*Code	Native Status
I	Introduced
N	Native
NI	Native and Introduced
W	Waif

*Code	Native Status Jursdiction
L48	Lower 48 States
AK	Alaska
HI	Hawaii
PR	Puerto Rico
VI	Virgin Islands
CAN	Canada
GL	Greenland
SPM	St. Pierre and Miquelon

[1] other than native or widely distributed species

Additional information about noxious plants in this state can be found at:

- CA-California Department of Food and Agriculture
- CA-California Invasive Plant Council
- CA-California Weed Management Areas
- CA-CalPhotos
- CA-CalWeed Database: California Noxious Weed Control Projects Inventory: County Lists
- CA-Calweeds Database
- CA-Encycloweedia (CDFA)
- CA-Practical Guidebook for Invasive Aquatic Identication & Control
- CA-UC Davis Integrated Pest Management
- CA-UC Davis Weed Research and Information Center
- CA-UC IPM Online Weed Photo Gallery
- TNC: Wildland Invasive Species Program

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NEVADA NOXIOUS WEED LIST BY CATEGORY

(NAC 555.010)

Category A Weeds:

Category A noxious weeds are weeds that are generally not found or that are limited in distribution throughout the State.

African rue	(*Peganum harmala*)
Austrian fieldcress	(*Rorippa austriaca*)
Swainsonpea	(*Sphaerophysa salsula*)
Black henbane	(*Hyoscyamus niger*)
Camelthorn	(*Alhagi* maurorum)
Common crupina	(*Crupina vulgaris*)
Dalmatian toadflax	(*Linaria dalmatica*)
Dyer's woad	(*Isatis tinctoria*)
Eurasian water-milfoil	(*Myriophyllum spicatum*)
Giant reed	(*Arundo donax*)
Giant salvinia	(*Salvinia molesta*)
Goatsrue	(*Galega officinalis*)
Crimson fountain grass	(*Pennisetum setaceum*)
Houndstongue	(*Cynoglossum officinale*)
Hydrilla	(*Hydrilla verticillata*)
Iberian starthistle	(*Centaurea iberica*)
Common St. Johnswort	(*Hypericum perforatum*)
Malta starthistle	(*Centaurea melitensis*)
Mayweed chamomile	(*Anthemis cotula*)
Mediterranean sage	(*Salvia aethiopis*)
Purple loosestrife	(*Lythrum salicaria, L. virgatum* & cultivars)
Purple starthistle	(*Centaurea calcitrapa*)
Rush skeletonweed	(*Chondrilla juncea*)
Sow thistle	(*Sonchus arvensis*)
Spotted knapweed	(*Centaurea maculosa*)
Squarrose knapweed	(*Centaurea virgata*)
Sulfur cinquefoil	(*Potentilla recta*)
Syrian bean caper	(*Zygophyllum fabago*)
Yellow starthistle	(*Centaurea solstitialis*)
Yellow toadflax	(*Linaria vulgaris*)

Category B Weeds:

Category B listed noxious weeds are weeds that are generally established in scattered populations in some counties of the State.

Horsenettle	(*Solanum carolinense*)
Diffuse knapweed	(*Centaurea diffusa*)
Leafy spurge	(*Euphorbia esula*)
Medusahead	(*Taeniatherum caput-medusae*)
Musk thistle	(*Carduus nutans*)
Russian knapweed	(*Acroptilon repens*)
African mustard	(*Brassica tournefortii*)
Scotch thistle	(*Onopordum acanthium*)
Silverleaf nightshade	(*Solanum elaeagnifolium*)

Category C Weeds:

Category C listed noxious weeds are weeds that are generally established and generally widespread in many counties of the State.

Canada thistle	(*Cirsium arvense*)
Hoary cress	(*Cardaria draba*)
Johnsongrass	(*Sorghum halepense*)
Perennial pepperweed	(*Lepidium latifolium*)
Poison-hemlock	(*Conium maculatum*)
Puncture vine	(*Tribulus terrestris*)
Salt cedar (tamarisk)	(*Tamarix* spp.)
Spotted water hemlock	(*Cicuta maculata*)